BUREAU OF HYGIENE AND TROPICAL DISEASES.

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MEDICAL ZOOLOGY.

STILES (C. W.). **Amendments to the International Rules of Zoological Nomenclature. Important Notice to Zoologists, Physicians, Veterinarians, and others using Zoological Names.**—*Public Health Rep.* 1927. Oct. 28. Vol. 42. No. 43. pp. 2639–2640.

"ARTICLE 25. The valid name of a genus or species can be only that name under which it was first designated on the condition :—

"(*a*) That (*prior to January 1, 1931*) this name was published and accompanied by an indication, or a definition, or a description ; and

"(*b*) That the author has applied the principles of binary nomenclature.

"(*c*) *But no generic name nor specific name published after December* 31, 1930, *shall have any status of availability* (*hence, also, of validity*) *under the rules, unless and until it is published either*—

"(1) *With a summary of characters* (*seu diagnosis ; seu definition ; seu condensed description*) *which differentiate or distinguish the genus or the species from other genera or species ;*

"(2) *Or with a definite bibliographic reference to such summary of characters* (*seu diagnosis ; seu definition ; seu condensed description*). *And further* :—

"(3) *In the case of a generic name, with the definite unambiguous designation of the type species* (*seu genotype ; seu autogenotype ; seu orthotype*).

"The purpose of this amendment is to inhibit two of the most important factors which heretofore have produced confusion in scientific names. The date, January 1, 1931, was selected (instead of making the amendment immediately effective) in order to give authors ample opportunity to accommodate themselves to the new rule.

"The Commission unanimously adopted the following resolution :

"(*a*) It is requested that an author who publishes a name as new shall definitely state that it is new, that this be stated in only one (i.e., in the first) publication, and that the date of publication be not added to the name in its first publication.

"(*b*) It is requested that an author who *quotes* a generic name, or a specific name, or a subspecific name shall add at least once the author and year of publication of the quoted name or a full bibliographic reference.

"The foregoing resolution was adopted in order to inhibit the confusion which has frequently resulted from the fact that authors have occasionally published a given name as 'new' in two to five or more different articles of different dates—up to five years in exceptional cases."

A. Alcock.

(K 3447) Wt P18/261 1,625 4/28 H & Sp Gp 52

Blacklock (D. B.) & Gordon (R. M.). **The Experimental Production of Immunity against Metazoan Parasites and an Investigation of its Nature.**—*Ann. Trop. Med. & Parasit.* 1927. July 22. Vol. 21. No. 2. pp. 181–224. With 2 graphs & 2 figs. on 1 plate. [31 refs.] [Sir A. L. Jones Research Lab., Freetown, Sierra Leone.]

The authors' preliminary account of their experimental immunization of guineapigs to the parasitic larva of the tumbu fly, *Cordylobia anthropophaga*, have been noticed in this *Bulletin* (Vol. 24, p. 861). The present paper contains the full details of their investigation, namely, the experimental proof of a true immunity "acquired as a result of previous infection or vaccination, and involving the death of the metazoan parasite in the host within a specified time"; and the experimental determination of the nature of this immunity. The following are their conclusions:—

"(*a*) It is a skin immunity confined at first to areas of skin into which the parasite has previously penetrated or which have been vaccinated with larvae or emulsions of larvae.

"(*b*) The general circulation and the deeper tissues, while necessary for the immunity, take no direct part in the destruction of larvae which have penetrated immune areas, since 79 per cent. of such larvae are dead within forty hours, i.e. before they have penetrated the deeper tissues.

"(*c*) The immunity, which is at first localized, tends to spread from the primary focus, so that areas which have never been the site of invasion by the parasite may ultimately become immune.

"(*d*) It has been shown that the immunity lasts for at least three months; it probably persists much longer.

"(*e*) The immunity is reproduced in new skin which grows on an abraded immune area; it persisted (one experiment only) in skin transplanted from an immune to a non-immune animal; it does not, however, persist in portions of immune skin which are removed from the animal and kept *in vitro*.

"(*f*) The occurrence of eosinophilia in certain forms of metazoan infection is well known; in this study we have made experiments which showed that:—

"i. A high degree of immunity may exist with or without eosinophilia.

"ii. A high degree of eosinophilia may exist with or without immunity.

"iii. Certain experiments which were performed suggested that applications of emulsions of the parasite to an animal may produce entirely opposite effects on the eosinophile percentage according to the method adopted, e.g., intraperitoneal injection markedly lowers it, subcutaneous injection or application of larval emulsions as a dressing to the abraded skin equally markedly raise it, while similar dressings applied to the unbroken skin either do not alter it at all or else they reduce it.

"No evidence of toxic effects or anaphylaxis, similar to those described as resulting from injection of Ascaris, Oestrus and Hypoderma have been observed by us. Nor has the application of larvae in hundreds during the experiments ever produced signs of anaphylaxis. No visible reaction has resulted from the application of emulsions of any stage of the larva to the conjunctiva or the skin of either immune or non-immune animals.

"The metazoan immunity described is governed by laws which differ widely from those governing bacterial immunity."

A. A.

WRIGHT (W. Rees). **A Note on Mounting Media for Parasitological Materials.**—*Ann. Trop. Med. & Parasit.* 1927. July 22. Vol. 21. No. 2. pp. 179–180. [2 refs.] [Univ. Coll. of N. Wales, Bangor.]

The medium here recommended, for mounting objects such as nematodes for the microscope, is made by mixing equal weights of flowers of camphor and pure phenol and adding to the oily product about twice its volume of a thin solution of gum sandarac in iso-butylic alcohol. This medium can also be used for mounting sections stained with carmine or haematoxylin, but is not recommended for Romanowsky stains. The advantage claimed for camphor-sandarac media is that objects can be mounted straight from 70 per cent. spirit.

A. A.

FRANCIS (Edward). **Microscopic Changes of Tularaemia in the Tick *Dermacentor andersoni* and the Bedbug *Cimex lectularius*.**—*Public Health Rep.* 1927. Nov. 11. Vol. 42. No. 45. pp. 2763–2772. With 9 figs. (7 on 4 plates). [5 refs.]

Ticks take an important part in the transmission of tularaemia from rabbit to rabbit, and to man; bedbugs have transmitted the infection (experimentally only) to mouse and guineapig. In adult ticks infected experimentally (by feeding on infected guineapigs) the bacillus was found in the coelomic blood, and in packed masses distending the epithelial cells of the rectum and gut and Malpighian tubules; occasionally a pack of bacilli were seen free in the lumen of the gut, as if an infected cell had burst; the organisms were not detected with certainty in the salivary and reproductive glands or in any other tissue or organ. In bedbugs fed on infected mice much the same phenomena were observed; infection of the coelomic fluid (earlier in adult bugs than in larvae); packing and swelling of the epithelial cells of the after part of the midgut and frequently of the cells of the Malpighian tubules with bacilli; occasional clumps of bacilli, as from a burst cell, in the lumen of the gut; and freedom of gullet, salivary glands, reproductive organs and other parts from infection. Both histological and experimental observations indicate that an infected bug continues infected for the rest of life. The fresh faeces are infective.

A. A.

GREEN (F. N.). **Leech Infection.**—*Kenya & East African Med. Jl.* 1927. July. Vol. 4. No. 4. pp. 122–123.

In six months the author has had to deal with several cases of leeches, imbibed with drinking-water, remaining fast in some part of the nasopharynx or entrance to the gullet. The time-honoured remedy of a strong salt solution usually disengages them, but in a case where the leech was fixed in the posterior nares the author had at last to resort to chloroform and ether.

A. A.

FORTUYN (A. B. Droogleever). **Notes on the Striped Hamster (*Cricetulus griseus*, Thomas).**—*China Med. Jl.* 1927. Oct. Vol. 41. No. 10. pp. 859–863. With 1 text fig. [7 refs.] [Peking Union Med. College, Peking.]

These notes, which are severely technical, are based on examination of 350 individuals representative of both sexes and of various ages. The author infers, from observation of the parts, that the average number of young in a litter is six; and, from the condition of females collected at particular dates, that the striped hamster is by no means dormant and passive during its "hibernation."

A. A.

MAYER (Mayer), BORCHARDT (Werner) & KIKUTH (Walter). Die durch Milzexstirpation auslösbare infektiöse Rattenanämie (Ätiologie, Pathologie und Chemotherapie). [**The Infectious Anaemia of Rats after Spleen Removal.**]—*Beihefte z. Arch. f. Schiffs- u. Trop.-Hyg.* 1927. Vol. 31. No. 4. pp. 295–317. With 3 plates (1 coloured) & 2 charts. [14 refs.]

This is a matter-of-fact investigation of the phenomena of the pernicious anaemia that occurs in rats (both tame and wild) after removal of the spleen. The authors confirm the view that it is an infective disease due to minute parasites—here beautifully figured—within the red blood corpuscles. These parasites, which stain well with Giemsa and can be cultivated (sometimes to the third generation) in Noguchi medium, they consider to be closely related to the Bartonella of Oroya fever and also to have affinities with Grahamella—and with Rickettsia. The parasites can be passed to other spleen-bereft rats by intracardial inoculation, and also to the spleen-bereft hamster and mouse, although in the two last obvious blood-changes are not evident. Organic arsenic compounds were found to be specific remedies. The authors do not venture beyond the conclusion that they are dealing with an infection of rats which, though very widespread, is latent (until the spleen be removed). They think the infection may be introduced through the gastro-intestinal tract and may lodge in the cells of internal organs, but very sparsely in the blood. The incitement to multiplication in the peripheral blood after removal of the spleen naturally opens up the question of the protective significance of the spleen in other kinds of anaemia, and in Oroya fever.

A. A.

HEGNER (Robert). **Excystation in Vitro of Human Intestinal Protozoa.**—*Science.* 1927. June 10. Vol. 65. No. 1693. pp. 577–578. [6 refs.] [Sch. of Hyg. & Pub. Health, Johns Hopkins Univ., Baltimore.]

The author reviews observations of others who have described excystation, severally, of *Entamoeba histolytica*, *Iodamoeba williamsi*, and the species known to some as *Councilmania lafleuri*, under simple conditions of temperature (about 37° C.) and moisture; and he here describes his own observation, under those simple conditions, of excystation of *E. coli*, *Endolimax nana*, and *Chilomastix mesnili*, and also of preparation for excystation in *Giardia lamblia*. He therefore concludes against the theory that hospiciary digestive solvents are necessary for the liberation of the encysted parasite.

A. A.

HEGNER (R. W.). **Homologies and Analogies between Free-Living and Parasitic Protozoa.**—*Amer. Naturalist.* 1926. Nov.–Dec. Vol. 60. pp. 516–525. [Dept. Med. Zool., Sch. of Hyg. & Pub. Health, Johns Hopkins Univ., Baltimore & London Sch. of Hyg. & Trop. Med.]

The author compares the structure, life-cycle, habitat, and activities of *Amoeba proteus* and *Entamoeba coli* in particular and of other free-living and other parasitic protozoa in general terms, to illustrate the fact that the workings of existence are governed by the same principles in both kinds of organisms—free-living and parasitic.

A. A.

BISHOP (Ann). **The Effect of Increased and Decreased Oxygen Pressure upon the Intestinal Protozoa of** *Macacus rhesus.*—*Parasitology.* 1927. Dec. Vol. 19. No. 4. pp. 401–404. [14 refs.] [National Inst. for Med. Research, London.]

CLEVELAND found (see this *Bulletin*, Vol. 22, pp. 835, 836) that by increased oxygen pressure the intestinal protozoa of termites ("white ants") were killed—though in his experiments with a vertebrate animal (rats) under such pressure (3½ atmospheres) the intestinal protozoa were still alive when their hosts had succumbed. From experiments with two rhesus monkeys, carefully enunciated in the present paper, it is concluded that "an increase in oxygen pressure, within the limits tolerated by a monkey, has no real effect in eliminating the intestinal protozoa. A decrease in the pressure of oxygen also is without effect. It is therefore highly probable, as Cleveland indicated, that such a method is useless as a means of eliminating protozoa from human hosts." For the technique of experiment under varied oxygen tension reference is given to papers by J. A. CAMPBELL in *Jl. Physiol.*, 1927, Vol. 63, p. 325, and *Brit. Jl. Exp. Path.*, 1927, Vol. 8, p. 347.

A. A.

VOGEL (W. L.). **A Gram-Positive Diplococcus in Human Protozoal Infections.**—*Jl. Infect. Dis.* 1927. Oct. Vol. 41. No. 4. pp. 317–328. With 1 chart in text. [16 refs.] [Clinical Lab., Riverside, & General Hosp., Los Angeles, California.]

An account of a gram-positive diplococcus, differing immunologically from the haemolytic streptococci and the diplococcus of pneumonia, found in the intestinal flora of 54 out of 119 cases of suspected amoebiasis. Protozoa were found in 79 of the 119 cases, and pathogenous species of protozoa (chiefly *E. histolytica*) in 59 of the 79, and the diplococcus was observed in 54 of those 59. Emetine and stovarsol are not mortal to the diplococcus, and it is surmised that the organism may contribute to the pathology of protozoan infections especially in those cases that do not yield to treatment.*

A. A.

* BARZON & LOGAN report as the etiological factor in ulcerative colitis an organism which Vogel believes to be identical with this diplococcus, (*Arch. Int. Med.* 1925. Vol. 36, p. 818).

PICKARD (Rawson J.). **The Ameba *Councilmania Lafleuri*: its Appearance and Clinical Importance.**—*Jl. Lab. & Clin. Med.* 1927. Aug. Vol. 12. No. 11. pp. 1037–1047. With 42 text figs. [13 refs.]

A painstaking description of phenomena, and reiteration of arguments in favour of the validity of *Councilmania lafleuri*, interestingly and well marshalled. The author believes the amoeba Councilmania to be pathogenic in the manner that the small races of *E. histolytica* are pathogenic, causing low grade neurotoxic disorders and constipation; and that if *Councilmania lafleuri*, KOFOID and SWEZY, is not an acceptable species, then *E. coli* must be accepted as becoming pathogenic at times, undergoing at the same time structural changes that are pathognomonic of the change and permanent.

He also writes: "If the goddess of science has a form of worship it is the religion of doubt" [and the doubt is whether the permanent structural characters that distinguish *lafleuri* are natural or artefacts].

H. M. Hanschell.

WIGHT (T. H. Toynbee) & PRINCE (L. H.). **Artifacts in Endamoebae which have led to the Naming of a New Genus and Species.**—*Amer. Jl. Trop. Med.* 1927. Sept. Vol. 7. No. 5. pp. 287–309. With 7 plates. [12 refs.]

The authors renew their criticism of the specific validity of *Councilmania lafleuri*. We can indicate in an abstract no more than the general scope and content of an interesting and important work. The case, as presented in this paper, they claim to rest primarily on the series of excellent photographs which give graphic support to everyone of their contentions. So far they have discovered nothing to disprove their claim that rigidity of cyst wall, evidenced principally by irregularity of contour, and which has been subjected to terrific osmotic pressure, is responsible for the manufacture of this new species. KOFOID'S observations of "budding" in a saline preparation in which he saw the "budded" amoebula move away from the cyst may have been a pathological process dependent on extremely applied pressure. This observation requires confirmation. It is undoubtedly an extremely rare occurrence. The authors are of opinion that "budding" forms of *E. coli*, *E. histolytica* and *I. bütschlii* are mechanical effects: and that the naming of new species in connexion therewith is not justifiable, and that if *Councilmania lafleuri* be a legitimate species, then there are also other legitimate species bearing similar relations to *E. histolytica* and *I. bütschlii* to which personal names or other euphonious appellations might reasonably be given.

H. M. Hanschell.

SMITH (Septima C.). **Excystation in *Iodamoeba Williamsi* in Vivo and in Vitro.**—*Science.* 1927. Jan. 21. Vol. 65. No. 1673. pp. 69–70. [Sch. of Hyg. & Pub. Health, Johns Hopkins Univ., Baltimore.]

Guineapigs into whose stomach washed cysts of *Iodamoeba williamsi* had been injected were killed at intervals of one, three, four and six hours. No excystation occurred within one hour, but excysted amoebae were observed at three hours in the jejunum and ileum, and at four and

six hours in the ileum and caecum. Thus excystation of this amoeba may occur in the guineapig within a term of 3 hours. However, that excystation does not necessarily result in infection is proved by the fact that a number of guineapigs fed on repeated doses of viable cysts did not become infected.

Washed cysts of *I. williamsi* incubated at about 37° C. in normal saline were observed to be excysting usually at about 5 hours.

A. A.

Gittings (John C.) & Waltz (Arthur D.). *Dientamoeba fragilis.*—*Amer. Jl. Dis. Children.* 1927. Oct. Vol. 34. No. 4. pp. 542–546. [4 refs.] [Children's Hosp., Philadelphia.]

The existence of some eosinophilia in three asthenic and somewhat ill-nourished children led to examination of stools and the revelation of *Dientamoeba fragilis.* The authors consider it possible, yet "problematic," that the amoeba was the cause of asthenia.

A. A.

Čapek (Alfred). Die Flagellaten-Urethritis des Mannes. (Vorläufige Mitteilung.) [**Flagellate Urethritis of Man.**]—*Med. Klin.* 1927. Oct. 7. Vol. 23. No. 40 (1191). pp. 1535–1539. With 7 text figs. [17 refs.] [General Hosp., Iglau.]

The author reviews at some length four published cases known to him where *Trichomonas vaginalis* was observed in the urine of males, and he describes in some detail two similar cases that have occurred in his own practice. In both cases besides the active flagellates there was blood in the urine; in one case there was pain in the urethra, in the other case pain in the right testicle; in one case also the patient was a married man whose wife had slight colpitis with Trichomonas in the mucus. The author discusses these cases and considers that Trichomonas urethritis is a venereal disease, in which more or less blood is always to be found in the urine and a purulent or fibrinous exudation may be observed at the meatus; probably also there is a concurrent bacterial infection of the anterior part of the urethra.

The author appends a series of crude figures which he thinks represent a pair of the flagellates fused preparatory to reproduction. The weird and dissimilar changes that each individual undergoes are described in detail (and also in general, as "complicated").

A. A.

Hogue (Mary Jane). **Trichomonas in Urine.**—*Amer. Jl. Trop. Med.* 1927. Sept. Vol. 7. No. 5. pp. 327–330. [14 refs.] [School of Med., Univ. of Pennsylvania.]

In a systematic search for Trichomonas in the urine from 516 patients male and female, the organism (*T. hominis*) was found in only one case, and that was from faecal contamination. Subsequent to publication the author received from outside three specimens of urine containing *T. vaginalis.*

A. A.

VAVILOVA (N. M.). **Some Observations of** *Trichomonas vaginalis.*—*Russian Jl. Trop. Med.* 1927. Vol. 5. No. 8. English summary pp. 534–535. [In Russian pp. 513–520. With 2 figs. 19 refs.] ["Sneguirov" Hosp., Moscow.]

The English summary states that the author found *Trichomonas vaginalis* in 35 out of 100 in-patients in Moscow, and in 28 out of 100 out-patients in Bokhara, the reaction of the vaginal secretion usually being acid: that the presence of blood in the secretion was favourable to their multiplication; that in the whole 200 cases they were found only once in the urethra and not once in the cervix; and that in a case of chronic gonorrhoea they were packed in large numbers in two para-urethral passages.

A. A.

HEGNER (Robert) & RATCLIFFE (Herbert). **Trichomonads from the Vagina of the Monkey, from the Mouth of the Cat and Man, and from the Intestine of the Monkey, Opossum and Prairie-Dog.**—*Jl. Parasit.* 1927. Sept. Vol. 14. No. 1. pp. 27–35. With 4 text figs. & 4 figs. on 1 plate. [School of Hyg., Johns Hopkins Univ., Baltimore, Md.]

From the four quadrupeds mentioned in the title as many new species of Trichomonas are here described, not without some reluctant discussion, but with some illuminative figures. Measurements of vaginal and of intestinal trichomonads of the same monkeys were practically coincident, and since no morphological differences were evident, the authors incline to the opinion that the vagina both in monkeys and in man becomes infected with trichomonads from the intestine.

"A comparison of specimens of *T. macacovaginae* taken directly from the vagina of the monkey with specimens taken from serum-saline-citrate cultures after a period of 51 days showed an increase in size due probably to favourable conditions of nutrition in the culture medium"; comparable differences were observed in the case of *T. hominis* from fresh faex and after culture for 13 days.

A. A.

ESCOMEL (Edmundo). El tratamiento de la tricomonosis intestinal: un asunto concluido. [**The Treatment of Intestinal Trichomoniasis.**]—*Gac. Med. de Caracas.* 1927. May 31. Vol. 34. No. 10. pp. 145–146.

The author's treatment is as follows: a spoonful of a mixture containing 2–4 gm. of essence of turpentine in 150 gm. emulsion every two hours for three days. Every night and morning an *evacuant* enema of a litre of decoction of eucalyptus, followed by a second enema of 4 spoonfuls of hot water, 10–20 drops of laudanum, and the yolk of an egg beaten up with 20–30 drops of essence of turpentine, to be retained till the next enema is due (12 hours), if possible. It is stated that *Trichomonas intestinalis* is usually harmless, but when it does acquire pathogenicity it causes death in 90 per cent. of cases. The turpentine is specific for this parasite exclusively.

H. Harold Scott.

GUPTA (A. K. Dutt). **The Possible Pathogenicity of** *Giardia intestinalis.* —*Indian Med. Gaz.* 1927. Oct. Vol. 62. No. 10. pp. 561–562.

In a routine examination of stools (1,750) at the Calcutta Hospital for Tropical Diseases, 6·2 per cent. of the patients concerned were found to be harbouring *Giardia intestinalis*, concurrently in 24·5 per cent. of them with *Entamoeba histolytica*, although in the majority of the cases the stools were not dysenteric in character (except that many of them contained Charcot-Leyden crystals). In the author's experience, diarrhoea, with passage of Giardia cysts, often persists after a patient has been treated for an amoebic infection—a fact that indicates the pathogenous character of Giardia. The author finds that stovarsol, though sometimes efficacious, does not always overcome the Giardia infection.

A. A.

MARCELLUS (M. B.). **An Unusual Case of** *Giardia intestinalis.*— *U.S. Veterans' Bureau Med. Bull.* 1927. Sept. Vol. 3. No. 9. pp. 925–928. [U. S. Veterans' Hosp., Portland, Oreg.]

A chronic case—dating from the Hispanio-American war, and beginning, in the Philippine Islands, as diarrhoea and dysentery—of painful and severe gastro-intestinal disorder, treated by divers physicians at various times during 28 years as gall-stone, cholecystitis, or malignant disease of gall-bladder or stomach or bowels, and now (July 1926) sent to hospital as an urgent case of questionable gall-stones. At admission the patient was suffering from constant vomiting and appeared moribund ; he was anaemic, emaciated, and fevered at evening. Examination of stools disclosed nothing ; but tubage of the gall-bladder yielded myriads of active Giardia. After a single intravenous injection of 0·9 gm. of neoarsphenamine his temperature became normal, and after the fourth injection there were no signs of flagellates in the tubage. During four months in hospital, though he had two recurrences of flagellates (which were cured very quickly by neoarsphenamine), he gained 35 lb., and he was then discharged declaring himself to be " in the best health enjoyed for many years." Readmitted 3 months afterwards he complained mostly of eczema of both shins ; active flagellates were found by tubage and disappeared after neoarsphenamine treatment. It is noted that gastro-intestinal symptoms accompanied only one of the recurrences, and then were slight ; also that at the third intravenous injection of arsphenamine, the duodenal tube being in operation *in situ*, only dead and distorted flagellates were seen in the tubage 15 to 20 minutes after the administration of the injection.

A. A.

MADINAVEITIA (J. M.), RUIZ (Antonio) & RAMIREZ (Probo). Sobre la supuesta lambliasis vesicular. [**So-called Lamblial Infection of the Gall-bladder.**]—*Rev. Méd. de Barcelona.* 1927. July. Year 4. Vol. 8. No. 43. pp. 98–102. With 3 text figs.

The authors maintain that *Giardia intestinalis* come from the duodenum. They appear to infer that WESTPHAL & SMITHIES were mistaken in thinking that they saw Giardia in extirpated bladders.

H. Harold Scott.

VILARDELL (Jacinto). Rectitis ulcerativa tuberculosa y lambliasis. [**Tuberculous Ulceration of the Rectum and Infection with Giardia.**]—*Rev. Méd. de Barcelona.* 1927. Aug. Year 4. Vol. 8. No. 44. pp. 187–192. With 8 text figs. (6 coloured.)

The author records a case of pulmonary tuberculosis of several years' standing, later associated with tuberculous ulceration of the rectum and the presence of *Giardia intestinalis*. Sanocrysin was given, but with little effect until the parasites had been got rid of by the use of stovarsol and treparsol, when marked improvement in the pulmonary condition occurred and the rectal ulcers healed. He is firmly of opinion that the two conditions are associated as cause and effect.

H. Harold Scott.

HEGNER (Robert). **The Viability of Cysts of *Giardia lamblia* from Man in the Stomach of the Rat.**—*Amer. Jl. Hyg.* 1927. Nov. Vol. 7. No. 6. pp. 782–785. [7 refs.] [Sch. of Hyg., Johns Hopkins Univ., Baltimore, Md.]

Of cysts of *Giardia lamblia* (from man), 18 to 42 hours old, injected into the stomach of rats some were there killed, but some remained alive within the stomach for as long as 6 hours. When placed in the warm chamber cysts that had been in the stomach from 1 to 6 hours showed signs of activity sooner than control cysts (from identical sources).

A. A.

DA FONSECA (O.). Sur le flagellé *Enteromonas hominis*. [**The Flagellate *Enteromonas hominis*.**]—*C.R. Soc. Biol.* 1927. Oct. 21. Vol. 97. No. 27. pp. 1086–1087. With 7 text figs.

The author remarks the cosmopolitan range of this species, and describes the occasional occurrence of multiple fission.

A. A.

ROBERTSON (Muriel). **Notes on Certain Points in the Cytology of *Trypanosoma raiae* and *Bodo caudatus*.**—*Parasitology.* 1927. Dec. Vol. 19. No. 4. pp. 375–393. With 39 figs. (18 coloured) on 2 plates. [37 refs.]

The following is the author's own summary :—

"1. *T. raiae* and *Bodo caudatus* are investigated using Feulgen's nucleal reaction in addition to the usual nuclear stains. The nature and value of this method is discussed.

"2. In *T. raiae* the parabasal body or kinetonucleus is found to consist of chromatin as shown by the nucleal reaction. An achromatic element in its composition is suggested in the division by the desmose between the two halves being achromatic.

"The blepharoplast is an achromatic structure. It seems probable that it persists in the aflagellar phase of the trypanosome. In *T. raiae* the division of the blepharoplast precedes but does not apparently orientate the division of the parabasal body. The division of the parabasal body does not present a mitotic figure.

"3. The nucleus in *T. raiae* consists of an achromatic karyosome body with some chromatin surrounding it, there is also chromatin arranged upon the inner surface of the nuclear membrane.

"4. At division the karyosome apparently draws out into an achromatic spindle figure, the chromatin collects in the prophase into a loose granular mass and then becomes arranged at the equator. The mass divides into

two portions ; it is not possible to distinguish chromosomes with sufficient certainty. The nuclei are finally reconstructed from the achromatic ends of the spindle and the chromatin which has travelled to either pole.

" 5. In *Bodo caudatus* the parabasal body (kinetonucleus) is composed of chromatin and of an achromatic substance, the blepharoplasts or basal granules are achromatic bodies which play an orientating part in the division of the parabasal body : this division does not show an equatorial plate stage. The nucleus is made up of an achromatic nucleolus-karyosome surrounded by a hollow sphere of chromatin ; there is a very definite division process which takes place apparently within the nuclear space. There is no equatorial plate formed and the achromatic figure which is derived directly from the karyosome is a division column which inserts itself into the already dividing chromatin and is not of the spindle fibre type found in the mitosis of the metazoan cell and of many protozoa."

A. A.

Bourova (L. F.). Sur les grains metachromatiques des leishmania et des trypanosomes ; leur rapport avec la virulence. [**Metachromatic Granules of Leishmania and Trypanosomes and their Relation to Virulence.**]—*Russian Jl. Trop. Med.* 1927. Vol. 5. No. 8. French summary p. 525. [In Russian pp. 520–525.]

The French summary states that the author has recognized metachromatic granules in Leishmania and declares them to be the product of the internal metabolism ; that he has observed them also in trypanosomes (*T. brucei* and *equiperdum*) where they vary greatly according to the species of host and the intensity of its infection ; and that he considers them to to be the support of toxins.

A. A.

Schule (Paul A.). *Isospora hominis* : **a Second Case of Infection in the Philippine Islands.**—*Amer. Jl. Trop. Med.* 1927. July. Vol. 7. No. 4. pp. 217–219. [4 refs.] [U.S. Army Med. Dept. Research Board, Manila.]

The author notes that about 150 cases of infection with *Isospora hominis* (Rivolta) Dobell, 1919, have been reported. About one-half of these were recorded during and immediately after the Great War. It was suggested that the infection was contracted by service in the Near East or by contact with troops returning from that area. Seven infections were found in American soldiers returning from over seas ; but four more were found in Americans who had had only home service. The geographical distribution of cases more recently reported indicates that the area of endemicity probably includes all tropical and subtropical countries.

Only one case of infection had heretofore been reported from the Philippine Islands—by Haughwout (1921) who suggested that infection might have been acquired in the United States. [See this *Bulletin*, Vol. 19, p. 105]. The case now reported undoubtedly occurred in the Philippine Islands. The patient, a white woman, 35 years old, had not been out of the Philippine Islands for 6 years. She had suffered for two months from epigastric distress and pain, intermittent diarrhoea, nausea, tiredness. Stools were partially formed, and not unusual in any respect save for the presence of oöcysts of *I. hominis* (Professor F. G. Haughwout confirmed the diagnosis).

The author refers to Connal's (1922) case of laboratory infection with *I. hominis ;* the patient suffered from diarrhoea, abdominal discomfort, flatulence, loss of weight, lassitude [*Tom. cit.*, p. 822.]

Connal emphasized that oöcysts appeared in the faeces only during a short period toward end of illness, "when the oöcysts appear in the faeces, the acute phase of the illness is over." This explained failure to find the parasite more frequently in other possible cases.

H. M. Hanschell.

Huff (Clay G.). **Studies on the Infectivity of Plasmodia of Birds for Mosquitoes, with Special Reference to the Problem of Immunity in the Mosquito.**—*Amer. Jl. Hyg.* 1927. Nov. Vol. 7. No. 6. pp. 706–734. With 4 figs. [19 refs.] [Sch. of Hyg., Johns Hopkins Univ., Baltimore, Md.]

The author produces evidence of several species of Culicines observed by him to be susceptible to one or other species of bird Plasmodium, and of several species apparently insusceptible. He approached this question of immunity on the assumption that it might be explicable by a difference in digestive power, and fed a highly susceptible species (*Culex pipiens*) and a naturally immune species (*Aedes sollicitans*)— both being huge feeders and equally voracious— on birds heavily infected with *Plasmodium cathemerium*. The length of life of the asexual parasites in the stomach was observed to be the same in both species (5–6 hours) although in *Ae. sollicitans* parasites could be observed, changed, for about 14 hours longer ; ookinetes made their appearance in both species in 12 hours and "remained until the end of the series;" till 20 hours in *Ae. sollicitans* and 39 hours in *Culex pipiens* ; the digestion of red cells " in general required about the same time in each species." Of the different powers of digestion theory there is here no clear proof and the author awaits further observation and experiments.

A A.

MacDougall (Mary Stuart). **The Effects of Changes in the Sugar Content of the Blood on Bird Malaria.**—*Amer. Jl. Hyg.* 1927. Sept. Vol. 7. No. 5. pp. 635–647. With 6 text figs. [11 refs.] [Sch. of Hyg., Johns Hopkins Univ., Baltimore, Md.]

In experiments of which the results are here recorded in the form of graphs and tables, various batches of canaries inoculated with a given strain (Hartman strain) of the parasite of bird-malaria were fed severally with dextrose, either continuously or at different intervals, during the course of infection ; or were injected in the same manner with insulin ; or received insulin and then dextrose. The conclusion is that increase in the sugar of the blood is favourable for the parasite, and decrease unfavourable.

A. A.

Aragão (Henrique de Beaurepaire). Evolution de l'*Haemoproteus columbae* et du *Trypanosoma hannai* dans la *Lynchia maura* Bigot. [**Development of** *H. columbae* **and** *T. hannai* **in** *Lynchia maura.*]—*C.R. Soc. Biol.* 1927. Aug. 26. Vol. 97. No. 25. pp. 827–829. With 3 figs. [Oswaldo Cruz Inst., Rio de Janeiro.]

The author [who, with others, formerly dissented] has now verified Mrs. Adie's discovery of a sporogony of *Haemoproteus columbae* in

Lynchia maura quite similar to that of Proteosoma and Plasmodium in mosquitoes. In the course of operations he discovered in the gut of *Lynchia maura* Crithidia-forms of the pigeon trypanosome (*T. hannai*).

A. A.

Lambert, Jr. (Samuel W.). **Sarcosporidial Infection of the Myocardium in Man.**—*Amer. Jl. Path.* 1927. Nov. Vol. 3. No. 6. pp. 663–668. With 2 figs. on 1 plate. [13 refs.] [Presbyterian Hosp., New York, N.Y.]

Case of a West Indian negress, age 32, who died the day after admission into hospital. At post-mortem examination oval masses (82 by 31 microns diameter) of small sickle- or spindle-shaped organisms were observed in sections of the intraventricular heart-muscle. These are judged to be an early developmental stage of some sort of Sarcosporidia. "There were no symptoms during life which could be referred to this infection."

A. A.

Vasudevan (A.). **A Case of Sarcosporidial Infection in Man.**—*Indian Jl. Med. Res.* 1927. July. Vol. 15. No. 1. pp. 141–142. With 9 figs. on 2 plates (3 coloured).

In muscle exposed in the bed of a meandering, undermining, chronic ulcer in the region of the nipple the author discovered a multitude of filamentous sarcocysts generally resembling, but much longer than Miescher's tubes. The spores are smaller and slenderer than Rainey's corpuscles, have both ends pointed, the nucleus not terminal (but sub-terminal, or even sometimes central), and the polar capsule indistinct and ill-defined, or absent. The author considers it to be a new species of Sarcocystis. Sections of the ulcer do not reveal any cysts or spores in the skin or subcutaneous tissue, and the author leaves the question open whether or not the ulceration may be due to sarcocystin. The ulcer and spores are well shown, in colour.

A. A.

Jameson (A. Pringle). **The Behaviour of *Balantidium coli* Malm. in Cultures.**—*Parasitology.* 1927. Dec. Vol. 19. No. 4. pp. 411–419. With 15 text figs. [9 refs.] [Inst. of Animal Path., Cambridge.]

The following is the author's summary :—

"*Balantidium coli* (from the domestic pig) can be readily cultivated in the medium devised by Dobell and Laidlaw (1926) for the cultivation of entozoic amoebae (inspissated horse-serum and Ringer-eggwhite, with solid rice-starch). If the hydrogen-ion concentration does not exceed the limits pH = 5·4–8·0, rich cultures can be obtained in this medium, at 37° C.; and strains of the ciliate can be readily propagated for any desired period if sub-cultures are made every 3–5 days.

"In such cultures conjugation occurs periodically; but encystation has never been observed, and all attempts to induce it under cultural conditions have hitherto failed.

" The conjugation of *Balantidium*, as seen in cultures, is peculiar, but it has been impossible as yet to elucidate all details of the process. Conjugants are always much smaller than non-conjugants, and frequently unequal in size. Apparently but one conjugant is fertilised, and survives as an exconjugant—the partner dying after separation.

" Encystation has never been seen to follow conjugation, as described by Brumpt (1909)."

A. A.

DA CUNHA (Aristides Marques) & MUNIZ (Julio). Sobre os ciliados do genero balantidium parasitos dos macacos. [**Balantidia Parasitic in Monkeys.**]—*Bol. Biol.* São Paulo. 1927. Apr. 11. No. 5. pp. 6–15. With 13 figs. [Oswaldo Cruz Inst., Rio de Janeiro.]

—— & ——. Ciliés du genre *Balantidium*, parasites des singes.—*C.R. Soc. Biol.* 1927. Aug. 26. Vol. 97. No. 25. pp. 823–825. With 1 text fig. [Oswaldo Cruz Inst., Rio de Janeiro.]

Description with numerous fine figures of *Balantidium aragaoi*, a new species, from the large intestine of *Cebus caraya*. It agrees with *B. caviae* in having a spheroid macronucleus, but differs in having two contractile vacuoles. The authors illustrate their description by comparison with *B. coli, suis, caviae*, and the Balantidium from *Cebus variegatus* described and figured by HEGNER and HOLMES.

A. A.

HOARE (Cecil A.). **Studies on Coprozoic Ciliates.**—*Parasitology.* 1927. Aug. Vol. 19. No. 2. pp. 154–222. With 96 figs. on 5 plates & 3 text figs. [102 refs.] [Wellcome Bureau Sci. Research, London.]

A comprehensive and critical—and withal highly interesting—study of three species of holotrichous ciliate Infusoria, namely *Lembus pusillus, Cyclidium glaucoma*, and *Uronema nigricans* (= *Uronema marinum*), which, although living free in both fresh and salt water, have a predilection for waters that are foul and may even be at home in certain states and kinds of faeces. Their medical interest lies in the accident that, in the author's well-justified opinion, one or other—perhaps all—of them have at times, under the pseudonym " *Uronema caudatum*," been wrongly styled pathogenous parasites of man. In the case of each species a very full account is given of synonymy, natural affinities, history in the zoological annals, structural details, behaviour, and bionomy. In order to establish the relation of the marine to the freshwater forms of the same species experiments on reciprocal acclimatization were made. All three species were cultivated in liquid dilutions of human (and other) faeces, preferring a slightly alkaline medium. Cyclidium could not be grown on pure (undiluted) faeces, but Lembus and (on one occasion) Uronema could. Cyst formation was observed in *Lembus pusillus* and is here described for the first time. The paper is finely illustrated.

Among his methods of investigation the author speaks highly of a technique recommended by SCHEWIAKOFF as particularly useful for demonstrating ectoplasmic detail for temporary observation.

" The infusoria placed in a drop of water on the slide are fixed with the vapours of osmic acid (1 per cent.). Then 1–2 drops of a weak (2–4 per cent.) solution of soda are added to the drop and carefully mixed with it, after which the slide is left uncovered for ¼–½ hour. The water

evaporates, the solution of soda becomes more and more concentrated and gradually dissolves certain albuminous compounds, bringing out in special relief the ectoplasm, cilia and other ectoplasmatic structures."

A. A.

Shortt (H. E.) & Swaminath (C. S.). *Monocystis mackiei* **n. sp. Parasitic in** *Phlebotomus argentipes*, **Ann. and Brun.**—*Indian Jl. Med. Res.* 1927. Oct. Vol. 15. No. 2. pp. 539–552. With 18 figs. on 4 plates.

This admirable paper, which is bountifully illustrated, relates the history and describes the ontogeny in detail and in its relation with the ontogeny of the host, and all the morphology and sporogony, and life-cycle of the parasite *Monocystis mackiei*.

In the natural environment the oöcysts are swallowed by the Phlebotomus larva; in due result the adult gregarines are found in the alimentary canal and body-cavity of the larva, and in the body-cavity of the pupa; and they pair and pursue the usual processes of sporogony in the adult Phlebotomus. Ripe oöcysts eventually break into the oviduct of the fly and issue in hundreds when the fly discharges its eggs. In its natural environment, therefore, the egg is beset by oöcysts, so that when the larvae issues from the egg some oöcysts must be swallowed at its first feed.

A. A.

Deschiens (R.), Limousin (H.) & Troisic (J.). Eléments présentant les caractères d'un protozoaire sanguicole observés chez le chimpanzé. [**Structures suggesting a Blood Protozoon in Chimpanzee.**]—*Bull. Soc. Path. Exot.* 1927. July 13. Vol. 20. No. 7. pp. 597–600. With 1 text fig. [3 refs.]

Description, figure, and discussion of a microscopic filiform organism, of appearances suggestive of *Sergentella hominis*, observed in the peripheral blood of a young chimpanzee under treatment for bacillary dysentery.

A. A.

Hegner (Robert). **Pathogenicity of Human Intestinal Protozoa.**—*Arch. Path. & Lab. Med.* 1927. June. Vol. 3. No. 6. pp. 1009–1027. [81 refs.] [Johns Hopkins Sch. of Hyg. & Pub. Health, Baltimore, Md.]

A general review, with bibliography, of recent advances in knowledge of this subject.

A. A.

Basile (Cosimo). Il Parassitismo intestinale lungo il Medio Uebi Scebeli. [**Intestinal Parasites in Somalia.**]—*Ann. di Med. Nav. e Colon.* 1927. Nov.–Dec. Year 33. Vol. 2. No. 5-6. pp. 269–281. [16 refs.]

Faecal examinations were made of 300 subjects, and parasites, in some form or other, were found in 277 (over 92 per cent.). Two forms were found in 87 instances (29 per cent.), slightly more often than one (28·33 per cent.), and three were present in 66 persons or 22 per cent. As many as seven were found in two instances.

Ancylostoma duodenale heads the list, being found in 93, *Entamoeba histolytica* next, in 90. Schistosomiasis is rare and certainly not endemic.

Sch. haematobium was present in five cases, and *Sch. mansoni* in two only. [Though the number of cases in which the various parasites were seen is given, it is unfortunate that the modes of combination are not stated.]

H. Harold Scott.

Chorine (V.). Sur la spécificité de l'immunité acquise chez les insectes. [**Specificity of Acquired Immunity in Insects.**]—*C.R. Soc. Biol.* 1927. Nov. 25. Vol. 97. No. 32. pp. 1395–1397. [Pasteur Inst., Paris.]

Answers to the question whether acquired immunity in invertebrates —particularly insects—is specific, or not, are contradictory; from experiments upon the bee-moth (*Galleria melonella*), here briefly described, the author concludes that it is far from being specific in this insect, at any rate for the first 12 days after specific attack. Caterpillars of this species could be immunized against *B. subtilis* var. *galleriae* by vaccines of various other specific microbes, although the resistance was weakened after 12 days. An interesting observation was that a vaccine of *Staphylococcus aureus* imparted immunity against other microbes but not against the staphylococcus itself.

A. A.

Scott (Hugh). **Notes on the Distribution and Habits of Culicidae in Central Abyssinia.**—*Bull. Entom. Res.* 1927. Sept. Vol. 18. Pt. 1. pp. 83–89. With 2 text figs. (maps) & 1 plate.

The mosquitoes mentioned in these notes were collected in the region of Addis Ababa and Lake Zwai, at elevations, as the author is aware, above the generally recognized range of malaria. The following species of Anopheles are included in the collection. *A. gambiae,* up to about 7,000 ft.; *A. mauritianus,* up to about 7,500 ft.; *A. pharoensis,* up to about 6,000 ft; and *A. transvalensis,* about 8,000 ft. *A. squamosus* is also mentioned as having been observed near Lake Tana by members of an earlier expedition to Abyssinia.

A. A.

Schwetz. Synopsis des moustiques connus du Congo belge avec quelques commentaires et considérations. [**Synopsis of Mosquitoes known in Belgian Congo.**]—*Rev. Zool. Africaine.* 1927. Vol. 15. No. 3. 49 pp.

This paper contains a list of all the known mosquitoes of the Ethiopian region, a list of all the species hitherto observed in Belgian Congo, and a further series of lists of the species observed in each of the particular provinces of that country.

A. A.

Dyar (Harrison G.) & Núnez Tovar (M.). Notas sobre insectos hematofagos de Venezuela. (Diptera, Culicidae, Psychodidae). [**Notes on Bloodsucking Insects of Venezuela.**]—*Gac. Med. de Caracas.* 1927. June 30. Vol. 34. No. 12. pp. 186–187.

A purely entomological paper containing descriptions of a new species of Haemagogus, of Culex, and of Aedes, and of the larva of *Culex innominatus* of Evans, and mention of four species of Phlebotomus with the synonyms of each, and of *Anopheles apicimacula*—all from Venezuela.

A. A.

Wright (W. Rees). **On the Effects of Exposure to Raised Temperatures upon the Larvae of Certain British Mosquitos.**—*Bull. Entom. Res.* 1927. Sept. Vol. 18. Pt. 1. pp. 91–94. [2 refs.] [Dept. of Agric., Univ. Coll. N. Wales, Bangor.]

In the author's experiments larvae of *Anopheles bifurcatus* were not affected by temperature below 31° C.; between 31° and 36° C. a varying number did not survive an exposure of 5 minutes; temperature above 37° C. killed them all, as also did exposure for one hour to a temperature of 35° C. Larvae of *Aedes detritus* were not affected by temperature below 37° C., though all died when exposed to a temperature of 35° C. for an hour; at 44° C. all became inert, and none revived. Larvae of *Culex pipiens* were not affected at 36° C.; none survived at 40°–41° C.

A. A.

Christophers (S. R.), Sinton (J. A.) & Covell (G.). **Synoptic Table for the Identification of the Anopheline Mosquitoes of India.**—*Health Bulletin, No. 10. Malaria Bureau No. 2.* 22 pp. With 37 figs. on 5 plates. 1927. Calcutta: Government of India Central Publication Branch.

Covell (G.). **Anti-Mosquito Measures.**—*Health Bulletin, No. 11. Malaria Bureau No. 3.* 24 pp. 1927. Calcutta: Government of India Central Publication Branch.

These are plenary official publications—admirable, though not containing anything original. No. 10 provides the means of identifyng the Indian species of Anopheles with a minimum of entomological apparatus: No. 11 is a well-considered and convenient survey of well-approved methods of restraining and suppressing mosquitoes and their larvae, chiefly from the malaria standpoint.

A. A.

Strickland (C.) & Chowdhury (K. L.). **An Anopheline Survey of the Bengal Districts.**—*Indian Jl. Med. Res.* 1927. Oct. Vol. 15. No. 2. pp. 377–426. [11 refs.] [School of Trop. Med., Calcutta.]

The ultimate object of this survey is to help to elucidate the question whether there be any agreement between a local prevalence of specific anophelines and local variation in the incidence of malaria, in Bengal. The survey, which embraced 25 of the 27 districts of the Province, was continued for six months (from mid-August to mid-February) survey-parties staying for a time at certain "centres" in each district and collecting larvae and adults there and thereabout. The greater part of the report consists of tabulated information [to some extent reduplicated] regarding the numbers and percentages of larvae of each species collected in each "centre," district, and administrative Division, and the distribution of larvae of each species in its breeding-grounds of various kinds in each centre and district. The tables also include a numerical list of the species of adult anophelines caught at various places.

Of the 17 (or 18) species found during the survey, only four (or five) were found in large numbers, namely: *A. sinensis* (40·1 per cent.), *A. fuliginosus* (25 per cent.), *A. rossi* and *vagus* (15·4 per cent.),

and *A. barbirostris* (9·4 per cent.). Of less frequent occurrence were *A. aconitus* (3·6 per cent.), *A. culicifacies* (2·5 per cent.) and *A. pseudojamesi* (1·5 per cent.). (The percentages are calculated from 9,000 larvae that survived for examination).

Of all natural breeding-grounds for Anopheles the most abundant in Bengal are abandoned or dying river-channels. Other nurseries here enumerated and defined are tanks, if not quite choked with water-hyacinth and other weed; *Khals* (channels connecting rivers or draining from swamps) if not full of muddy water; small streams; cutcha drains; irrigation canals; swamps and *bheels*; pools of rain-water, and pools in river-beds even when bare of weed; road-side ditches; borrow-pits in villages and along road and railway embankments, unless they are full of muddy water; paddy-fields; and jute-fields, except when the cut jute is steeping in them. (Tree-holes—usually bamboo—fill up with rainwater and are tenanted only by culicines).

The authors include a short review of the papers and reports of previous observers of the anophelines of Bengal.

A. A.

Meleney (Henry E.), Lee (C. U.) & Chang (H. L.). **A Preliminary Survey of the Anopheline Mosquitoes of the Peking Area.**—*China Med. Jl.* 1927. June. Vol. 41. No. 6. pp. 509–512. [2 refs.] [Peking Union Med. Coll., Peking.]

Three Anopheles species—*A. hyrcanus* var. *sinensis*, *A. pattoni*, and *A. lindesaii*—occur in the neighbourhood of Pekin. The first, which is probably the carrier of malaria on the surrounding plains, breeds only on the plains and at the foot of hills, in ponds, rice-fields, and sluggish streams. The second breeds mostly in hill streams, but sometimes in ponds at the foot of hills. The larvae of *A. lindesaii* were found in a spring at about 1,050 ft.

A. A.

Koidzumi (Makoto) & Hakushi (Rigaku). **The Anophelines of Formosa.**—*Taiwan Igakkai Zasshi* (*Jl. Med. Assoc. Formosa*). 1927. Oct. No. 271. English summary pp. 1–4. [In Japanese.]

In the catalogue of Anophelines of Formosa the author includes nine species, namely: *A. sinensis*, *pleccau* ("closely related to *lindesayi*"), *minimus*, *candidiensis* (a new species), *tessellatus*, *maculatus*, *splendidus* ("close resemblances" to *maculipalpis*), *hatorii* (probably *ludlowi*), and *fuliginosus*.

A. A.

Zotta (G.). Considérations sur l'anophélisme du delta du Danube. [**Anophelism of the Danube Delta.**]—*Bull. Soc. Path. Exot.* 1927. Oct. 12. Vol. 20. No. 8. pp. 801–811. With 1 map in text.

The author describes very briefly, with the addition of a rough chart, the delta of the Danube, and remarks the abundance there of Anopheles and the infrequence of malarial fevers. Two species of Anopheles

are present—*A. maculipennis* and *A. sinensis*—these being generally associated, in the vicinity of man, with *Taeniorrhynchus richardii* and *Aedes dorsalis*. The Anopheles congregrate in stables and other places where domestic animals are housed ; few, sometimes not any, are to be found in human dwelling-places ; and this remarkable contrast may be observed even in places where but one or two isolated houses stand amid a multitude of shelters for cattle and sheep ; the only habitations inside which Anopheles may be plentiful are solitary huts far distant from villages and the range of domestic animals, and inhabited perhaps by a single labourer during the busy summer. The author regards his observations as one more confirmation of Roubaud's "zoophilism."

A. A.

Root (Francis Metcalf). **Studies on Brazilian Mosquitoes. IV. Notes on some Brazilian Species of Anopheles.**—*Amer. Jl. Hyg.* 1927. Sept. Vol. 7. No. 5. pp. 599–605. With 11 figs. on 2 plates. [9 refs.]

A purely entomological paper. *Anopheles rockefelleri* of Peryassu is pronounced to be synonymous with *A. mediopunctatus* of Theobald ; and *A. tibiamaculata* of Neiva a synonym of *A. eiseni* of Coquillet. *A. fluminensis* is described, from 2 adult males and a larva and 2 pupa-skins, as a new species.

A. A.

Sepulcri (Piero). Rapporti tra anofelismo ed ambiente nella zona litoranea tra Piave e Livenza. (**The Relations between Anophelism and Environment in the Zone enclosed between the Piave and Livenza Rivers.**)—*Riv. di Malariologia.* 1927. July–Oct. Vol. 6. No. 4–5. pp. 728–750. With 1 map in text. [English summary p. 879.]

Notwithstanding the upset of sanitary order in Venetia during the war and the consequent increase of malaria there, states the summary, things are now so far improved again, that there are some localities where malaria has disappeared, though Anopheles still remains. The author's studies lead him to the conclusion " that if zooprophylaxis acts in such a manner as to diminish the probabilities of the contact between anopheles and man, it is however insufficient to destroy the links of the chain man-haemosporidium-mosquito, which has taken root through a very long period of time." The preference of *A. elutus* for salt waters is also noted.

A. A.

Falleroni (Domenico). Discussione sulla zooprofilassi e sulla biologia degli anofeli italiani. (**Discussion on the Zooprophylaxis and the Biology of the Italian Anopheles.**)—*Riv. di Malariologia.* 1927. July–Oct. Vol. 6. No. 4–5. pp. 751–777. [English summary pp. 879–880.] [Anti-Malarial Stations of the Pontine Marshes, Italy.]

According to the English summary this paper is a criticism of some papers recently published in the *Rivista*—reports by Pecori and

Escalar, by Ottolenghi, and by Missiroli and Hackett on anti-malaria operations undertaken by the Roman Government and at Italian experimental stations assisted by the Rockefeller Foundation. The paper also contains its author's own review—already published in this *Bulletin*, Vol. 24, p. 859—of some work of his own.

A. A.

Adova & Sebsnzow. Biologie et constitution physicochimique des tourbières et conditions qui y règlent le stationnement des larves d'anophèles. [**Biology and Character of Bogs in respect to the Presence of Anopheles Larvae.**]—*Bull. Soc. Path. Exot.* 1927. Oct. 12. Vol. 20. No. 8. pp. 811–823. [3 refs.]

In an earlier paper (see this *Bulletin*, Vol. 24, p. 883) the authors stated their conclusion from a laborious survey of certain marshes and bogs in Russia that waters overgrown with bog-moss (Sphagnum) are distasteful and sedgy (Carex) waters attractive to the breed of Anopheles. They now give the results of a further investigation of these and other local waters in an abounding detail that includes not only the organic environment, but also the microcosmic factors (physical, chemical, mineral, electric-conductive, etc., properties of the water) which reasonably may be supposed to operate on the organic environment as a whole rather than directly upon the one selected organism Anopheles. The detail is too specific and too much discriminative in its local reference for abstraction, so that the paper itself must be read by those who are interested in a study of much academic interest.

The authors begin by comparing the water in two claypits, one long abandoned, the other recently disused. The old pit (in which Anopheles larvae were plentiful) was margined with Utricularia and other higher vegetation, the bottom deposit was rich in organic débris, the water was hard chiefly with lime, and of high electric conductivity; the plancton was rich both in numbers and in species, and in the zoo-plancton entomostracous crustacea and rotifers were particularly exuberant. There was no vegetation about the newer pit, and its bottom consisted of pure clay; the water was not so rich in soluble organic matter, was hard chiefly with ferrous oxide, and was of much lower electric conductivity; the plancton was poor both in numbers and species, and in the zoo-plancton there were many rotifers but few entomostracous crustacea; this new pit with its organic environ-still " unstabilized " was avoided by Anopheles.

The water of a local lake in which Anopheles larvae could not be found was examined. It was clear, thick with moss and silkweed at the margin, contained a fair amount of soluble organic matter and algae, and supported a varied fauna; the water, however, was deficient in dissolved mineral matter, particularly lime.

Larvae of *A. maculipennis* were unexpectedly found in a rocky pool smelling of hydrogen-sulphide and thick with silkweed. The water, though overcharged with organic matter was rich in minerals, particularly lime, and was of strong electric conductivity.

Of the authors' conclusions from these and other observations, one of the least diffident appears to be that the tension of a water in lime and other mineral salts is one of the factors that determines the existence there of Anopheles larvae.

A. A.

Sinton (J. A.) & Covell (G.). **The Relation of the Morphology of the Buccal Cavity to the Classification of Anopheline Mosquitoes.**—*Indian Jl. Med. Res.* 1927. Oct. Vol. 15. No. 2. pp. 301–308. With 29 figs. on 5 plates. [8 refs.] [Central Malaria Bureau, Kasauli, India.]

In the female of all the anophelines (except Bironella and Anopheles *s.r.*) examined by the authors there is a buccopharyngeal armature consisting of a row, or rows, of stout chitinous "teeth," projecting from the posterior end of the ventral plate of the buccal cavity so as to form a sort of sieve between that cavity and the pharynx. These bucco-pharyngeal teeth were described by Annett, Dutton, and Elliott for *A. costalis*, and their absence in *A. maculipennis* and *punctipennis* was noted by Nuttall and Shipley and by Thompson. The present authors have studied this bucco-pharyngeal armature in 52—mostly Indian—species for evidence of specific peculiarities having phyletic implications; and the results, so far as they go, show a remarkable harmony between the grouping of anophelines by similarities and dissimilarities in the bucco-pharyngeal armature of the female and the grouping based on male genital characters. The authors have not studied a female of the sub-genus *Chagasia*; but otherwise, in all their 52 species (with one exception) the females can, by the general character of the bucco-pharyngeal armature be segregated in four groups corresponding severally with the other four anopheline subgenera as defined by Christophers. Thus in Anopheles (11 species examined) and Bironella (1 sp.) this armature is absent; in Myzomyia (38 sp.) it is very complex; and in Nyssorhynchus (2 sp.) it consists of two rows of teeth arising from a characteristic semilunar plate. Furthermore, within the complexities of the subgenus Myzomyia the five legions Myzomyia (s.r.) Neocellia, Cellia, Pseudomyzomyia, and Neomyzomyia can all be discriminated by particular characters of the armature. The structure, in its varieties, is described and well figured in the paper.

A. A.

Shropshire (James B.) & Zetek (James). **Unusual Anopheles Habitats in the Canal Zone.**—*Amer. Jl. Trop. Med.* 1927. Sept. Vol. 7. No. 5. pp. 331–338. With 4 text figs. [2 refs.]

Though there is little of surprising novelty in this paper, the details are interesting as illustrating (among other matters) how a sudden and temporary inundation, even if it be mainly due to the sea, may confound for a time all the intelligent anticipations of the sanitary department. Such an unforeseen sport of Neptune, at Punta Bruja in the Bay of Panama, covered 30 acres of dry land with water of high salinity, which, until the spit of sand left by the upheaval of the sea was cut through, was used as a prolific nursery by the notorious *Anopheles albimanus* and *tarsimaculatus*. Even the water impregnated with the caustic juice from fallen fruit of the deadly Manchineal (*Hippomane mancinella*, the most virulent member of the acrid Euphorbia family) which is used locally as a fish-poison, teemed with Anopheles larvae, the seawater providing the antidote to the poison.

Another ideal and prolific breeding-ground for the two local Anopheles was a brackish swamp choked with the tussocks of the giant polypody fern, *Acrostichum aureum*. Other breeding-places noticed were a water-

trough, iron tanks, dug-outs, crab-holes, and even a tree-hole. Larvae of a third dangerous species, *A. argyrotarsis*, were observed in tin cans lying in shrubbery and tall grass about houses.

A. A.

RODENWALDT (Ernst). **Entomological Notes IV.**—*Meded. Dienst d. Volksgezondheid in Nederl.-Indië.* 1927. Part 3. pp. 514–523. With 3 text figs. [Med. Lab. Weltevreden, Java.]

This paper contains tabulated detail of observed local distribution of Anopheles-species in islands and districts of Netherlands India. Good local instances are given of certain instructive phenomena: such as the sudden appearance of *Anopheles ludlowi* at Bencoolen as a sequence to the formation of brackish pools among sand dunes by streams stagnating in a time of excessive drought, and the subsequent local epidemic of malaria; and, again, the introduction of malaria following changes in the anopheline fauna—particularly the immigration of *A. maculatus* —due to clearing of jungle for open plantation. The occurrence of *A. ludlowi* inland at a height above 2,900 ft. is noted; also the absence of the larvae of this species from only some among the inland (freshwater) fishponds of a particular tract where the gross features of the natural environment seem uniform. A variety of *A. aitkeni* is described.

A. A.

GRIFFITTS (T. H. D.). *Anopheles atropos* **Dyar and Knab. A Note on its Breeding and other Habits.**—*Public Health Rep.* 1927. July 22. Vol. 42. No. 29. pp. 1903–1905. [2 refs.]

Anopheles atropos appears to breed only in salt water, its larvae conforming to salinities ranging from 3 to 12 per cent. In certain salt-marsh territories of the Gulf States of the U.S.A. it swarms in tormenting numbers, attacking people in broad daylight as well as at night, and freely invading habitations even at a distance of a mile from the marsh; the resting attitude is something Culex-like.

A. A.

BRAGINA (A.). [**The Biology of** *Anopheles maculipennis*, **Mg., with Introductory Notes by E. JUNKOVSKII.**] [In Serbian.]—*Glasnik Cent. Hig. Zavoda.* Belgrade. 1926. Vol. 1. (1). Pt. 1–4. pp. 119–145. [Summarized in *Rev. Applied Entom.* 1927. July. Vol. 15. Ser. B. Pt. 7. pp. 122–123.]

This author observes that the female *Anopheles maculipennis* mates before feeding and lays about 200 eggs, on an average, also that the new-hatched larvae feed on bacteria.

A. A.

ZETEK (James). **Rapid Determination of Anopheles Larvae in a New Medium.**—*Amer. Jl. Trop. Med.* 1927. July. Vol. 7. No. 4. pp. 247–249.

This author finds it convenient to identify living Anopheles larvae specifically by immersing them in a milky fluid, against the opacity of which the distinctive palmate scales stand out in relief.

A. A.

Dunn (Lawrence H.). **Mosquito Breeding in "Test" Water-Containers.** —*Bull. Entom. Res.* 1927. Sept. Vol. 18. Pt. 1. pp. 17–22. [W. Africa Yellow Fever Commission, Lagos, Nigeria.]

During six months—from December to June—the author carried on observations on the breeding of mosquitoes in the compound of the West Africa Yellow Fever Commission at Yaba, near Lagos, in Nigeria. The following conclusions on the breeding of one particular species, *Aëdes aegypti*, are given verbatim :—

"It would probably be necessary to continue this observation on the breeding occurring in the 'test' containers over a period of two years or more before a very definite analysis of the results could be made. However, from a consideration of the data presented in the foregoing tables the following conclusions in regard to *Aedes aegypti* appear reasonable :—

"1. A marked preference is shown for bamboo sections over tin cans as a place of oviposition.

"2. Water containing leaves seems to be more attractive to the ovipositing females than water only.

"3. Much breeding may occur in containers that are located one hundred yards from a habitation.

"4. The females may prefer the places of concealment afforded by grass and bush at a short distance from habitations to those in the more immediate vicinity or inside the houses.

"5. A seasonal variation occurs, the prevalence and breeding decreasing during the dry season and increasing with the beginning of the rainy season."

A. A.

Dunn (Lawrence H.). **Tree-Holes and Mosquito Breeding in West Africa.**—*Bull. Entom. Res.* 1927. Dec. Vol. 18. Pt. 2. pp. 139–144.

The breeding of mosquitoes in tree-holes here analysed was studied near Lagos during the rainy season ; 260 trees of 36 species, chiefly fruit-trees and ornamental shade-trees, yielded a collection of larvae from which 12,285 adult mosquitoes of 14 species were bred, all being Culicini. These included 1,141 individuals of *Aëdes* (*Stegomyia*) *aegypti* [vel *argenteus*], being the issue of larvae taken from 26·9 per cent. of the trees searched, some of which were 350 yards distant from the nearest house.

A. A.

Dunn (Lawrence H.). **Observations on the Oviposition of *Aëdes aegypti*, Linn., in Relation to Distance from Habitations.**—*Bull. Entom. Res.* 1927. Dec. Vol. 18. Pt. 2. pp. 145–148.

In these observations natural waterpots of bamboo stem were used ; and *Aëdes aegypti* preferred to deposit its eggs in outdoor pots set among bushes and trees rather than in pots inside houses. The outdoor pots were set 30 and 60 yards, and again at five equal intervals from 100 to 500 yards distant from habitations, and eggs of *Ae. aegypti* were found in the farthest—with no other known source of blood at hand.

A. A.

Legendre (J.). Races de *Stegomyia fasciata* et fièvre jaune. [**Races of *S. fasciata* and Yellow Fever.**]—*C. R. Acad. Sci.* 1927. Nov. 28. Vol. 185. No. 22. pp. 1224–1226. [3 refs.]

The question here proposed is: How comes it that yellow fever, endemic on the west coast of Africa, has never spread to south-eastern Africa or Madagascar or the Mascarene Islands, notwithstanding the existence of *Aëdes argenteus* in those places and the known facilities of sea-communication round the Cape in days before the significance of the insect was suspected?

The author surmises that there are two races of *Aëdes argenteus*, of which one can transmit yellow fever and the other can not, though both can transmit dengue fever.

Of the existence of two distinct races [" without prejudice "] he has no doubt. One of them, observed by him in Tonkin and Madagascar and Beyrout and called by him the " Oceano-Indian " race, is a small, fine-cut, elegant insect, and its larvae is slender and of a comparatively light colour. The other, which he names " Africano-American," is of a larger and clumsier make, and has coarse dark-coloured larva; this is the yellow fever race with which he has been familiar for two years in the Upper Volta region of West Africa. The author seems to be confident that " experimentation, a minor form of observation," will confirm these epidemiological and entomological facts.

A. A.

Connal (Sophia L. M. Summers). **On the Variations occurring in *Aëdes argenteus*, Poiret, in Lagos, Nigeria.**—*Bull. Entom. Res.* 1927. Sept. Vol. 18. Pt. 1. pp. 5–11. With 8 text figs. & 1 plate. [Med. Research Inst., Lagos.]

From the daily collections of the larvae brought to the Medical Officer of Health at Lagos in Nigeria, Mrs. Summers Connal has bred adults of *Aëdes argenteus* by the thousand, and with infinite care and patience has scrutinized 2,000 of those adults (a thousand of each sex), all fresh and untarnished, for exact evidence of variation.

Outside the one *constant* lyre-shaped device on the scutum—but even this is not quite free from diversity in definition and tint—she observes manifold variations, and in the present paper she records those of the abdominal vesture and of the tarsus of the hind legs as being the most conspicuous.

Concerning the abdomen: Although 68·9 per cent. of the thousand females and 85·2 per cent. of the thousand males had the typical proximal (" basal ") white crossband on each segment, among the others there were many (110 ♀ and 74 ♂) that had also a distal (" apical ") white crossband on each segment; many others (127 ♀ and 46 ♂) that besides this extra distal crossband had a median longitudinal white stripe and the general surface of the segments sprinkled or brindled with light scales; others again (40 ♀ and 21 ♂) in which the abdomen was entirely covered with white scales, to the practical exclusion of black; still others (25 ♀ and 7 ♂) that had the abdomen quite black, or purplish-black; and finally there were 9 females having only a distal (" apical ") white crossband on each segment. Moreover, apart from these definite variations in the number and distribution of the white scales, the ground colour of any among the insects might be some shade of brown rather than black.

Concerning the tarsus of the hind legs: In 58·3 per cent. of the thousand females and in 57 per cent. of the thousand males the last (5th) segment of the tarsus of the hind legs was typical, i.e., white. In all the other insects that segment had either a black tip—which might be reduced to a mere spot—or was to some considerable extent—½ to ¼— black. (These variations in the extent and distribution of the white scales of the terminal segment of the hind legs ranged throughout the whole 2,000 insects; but a typically-marked abdomen and a typically-marked terminal hind tarsal segment were *concurrent* in only 39 per cent. of the females and 47·7 per cent. of the males). Considerable variation was also observed in the relative distribution of white and black scales in the penultimate (4th) segment of the tarsus of the hind legs, as also in the actual proportions of this particular segment. The banding of the first three tarsal segments of the hind legs also showed variation.

A series of breeding experiments was carried out—females with all-white abdomen being mated each with a typical or some kind of non-typical male; some among the varied progeny of these unions were also mated. The results of each experiment are given in numerical and sex detail, but it must be sufficient to notice here the frequent occurrence of variation, distinct from that exhibited in either parent, that occurred among the progeny of both generations.

Experiments were also carried out to test the possible influence of modified light during larval life upon the colouring of the adult—white, black, and reddish-brown breeding-dishes being used in comparison; but no indication of any such influence was detected.

The above is merely a sketch of a most toilsome—and most important—investigation, which, it is hoped, the author may have renewed patience to continue.

A. A.

Petragnani (G.) & Castelli (A.). Le gambusie nella lotta anti-larvale in provincia di Cagliari (con particolare riguardo alla biologia). **Larval Control by Means of Gambusia in the Province of Cagliari (with Remarks on the Biology of this Fish.)**—*Riv. di Malariologia.* 1927. July-Oct. Vol. 6. No. 4–5. pp. 709–727. [2 refs.] [English summary pp. 878–879.] [Hyg. & Bact. Inst., R. Univ., Cagliari.]

The authors remark the hardihood of *Gambusia holbrooki* and its adaptability to waters fresh or salt or clean or foul or of varied temperature [an obdurate tolerance characteristic of the whole wide-ranging Cyprinodont family to which Gambusia belongs]; and they also note its Saturnine voracity for its own young. They state that they rarely find culicine larvae in permanent waters where this fish has been introduced. They recommend its periodic introduction into seasonal waters, in the proportion of one fish to each square metre.

A. A.

Hildebrand (Samuel F.). **A Study of the Top Minnow** *Gambusia Holbrooki* **in its Relation to Mosquito Control.**—*Public Health Bull. No. 153.* Wash. 1925. May. pp. vi+136. With 15 figs. (13 on 7 plates.) & 52 charts.

The object of this laborious study, which seems to have been pursued for four seasons, was to obtain some accurate information of the value

of the Cyprinodont fish *Gambusia holbrooki* in the suppression of mosquitoes. The observations were made in ponds and temporary swamps. Records of numbers of larvae collected both before and after introducing the fish were kept. In a number of instances sections of ponds that contained fish were divested of their fish, while other sections were left untouched, for comparison. The author describes his experiments [which, of course, can only have an approximation to precise experimental conditions] and their results. The account is too complicated with varying detail to be condensed; but the results are stated to show "in a measure" the efficiency of *Gambusia holbrooki* in the environments studied [ponds and temporary swamps]. The results for all the four seasons show a total reduction of Anopheles larvae and pupae of 57·8 per cent., and of Culicine larvae of 80·8; but reasons are given, at length, for thinking that the considered data under estimate the value of the fish. The data at any rate "show that the fish brought about very large reductions in mosquito-breeding."

A. A.

Legendre (J.). Poissons larvivores de la Haute-Volta. Technique de l'emploi des poissons contre les maladies à moustiques. [**Larvivorous Fish of the Upper Volta.**]—*Bull. Soc. Path. Exot.* 1927. June 8. Vol. 20. No. 6. pp. 476–480. [18 refs.]

In the Upper Volta district of French West Africa the local fish utilized by the author in dealing with mosquito larvae are the fry of two species of Siluridae (*Clarias lazera* and *Schilbe mystus*) and of a Cichlid (*Tilapia nilotica*).

A. A.

Balfour (Andrew). **Mosquito Control: an Historical Note.** [Correspondence.]—*Lancet.* 1927. Oct. 8. p. 790.

In a translation (by one John Parish, dated 1775) of a French book—"A Voyage to the Island of Mauritius," etc., the writer has discovered a proposal to carry frogs to Mauritius to "eat the eggs which the mosquito lays upon the surface of the standing waters."

[Apart from the questionable fitness of frogs for this service (the aquatic tadpole being carnivorous only under unnatural constraint), it may be remarked that the Mascarene Islands (among which Mauritius is included) possess a frog of their own, *Rana mascareniensis*, which is known to have been in existence in Mauritius when Charles Darwin visited the island in 1836.]

A. A.

Public Health Reports. 1927. Sept. 23. Vol. 42. No. 38. pp. 2337–2338.—**Mosquito Control by Airplane. Memorandum on the Distribution of Paris Green by Airplane in the Control of Anopheles Production in Uncleared Pond near Bamberg, S.C., September 8, 1927.** [Le Prince (J. A.); Legare (A. E.); McLean (Norman T.); Griffitts (T. H. D.); Williams, Jr. (L. L.); Cook (S. S.)]

The great development of hydro-electric power in the U.S.A. has led to special consideration of mosquito control measures for impounded-water reservoirs in which there is often both dense vegetation and, at the margins, much floating material.

The signatories of this report carried out a careful experiment on 500 acres of a pond where vegetation and floating material were abundant and where eleven out of every thirteen dips secured anopheles larvae (average five per dip).

Five hundred pounds of Paris green mixed with a like weight of powdered soapstone was distributed by an aeroplane flying 50 feet above the tree tops and "gridironing the area with paths approximately an eighth of a mile apart."

Twenty-two hours later, 703 dips were made from a boat, securing 3 living anopheles larvae, 84 dead larvae and six living pupae.

J. F. C. H.

DEL NEGRO (Carlos). O verde Paris na prophylaxia da malaria. Trabalho apresentado ao Terceiro Congresso Brasileiro de Hygiene. [In 2 Parts.] [**Paris Green in the Prevention of Malaria.**]—*Archivos de Hyg.* Rio de Janeiro. 1927. Sept. Vol. 1. No. 2. pp. 143–191. With 12 photographs & 1 map. English summary to Part 1 facing p. 158, and Part II facing p. 182.

The author applied 1 litre of Paris Green containing 40 per cent. As_2O_3 mixed with 100 litres of dust to 10,000 sq. metres of water, though a slightly less rate of distribution actually occurred. Such applications at 10 day intervals were effective to control breeding when the temperature range was between 28° C. and 17·7° C., though by the end of the period well developed larvae were found. Wind over 6 metres per second interfered with results on open water, but strong wind assists when vegetation is dense. Paris green is reported to have a caustic action on the bladders of *Utricularia oligosperma*.

J. F. C. H.

GRIFFITTS (T. H. D.). **Moist Sand Method of applying Paris Green for Destruction of Subsurface-feeding Mosquito Larvae.**—*Public Health Rep.* 1927. Nov. 4. Vol. 42. No. 44. pp. 2701–2705. [1 ref.]

Hitherto applications of Paris green have not been effective against bottom-feeding mosquito larvae. The author finds that mixture with moist beach sand (1 part to 99 by volume) renders the larvicide lethal both at the bottom and at the surface, most grains of the poison being carried down but sufficient remaining afloat to kill anopheline larvae. The lethal effect at the bottom is maintained for a longer period than it is at the surface with the ordinary dust application.

J. F. C. H.

BARBER (M. A.) & KOMP (W. H. W.). **Some Tests of the Larvicide "Stoxal."**—*Public Health Rep.* 1927. Aug. 5. Vol. 42. No. 31. pp. 1997–2004. [3 refs.]

Stoxal is described as consisting "essentially of trioxymethylene diluted with an inert dust." From their experiments in the southern States of the U.S.A., in May and June, the authors conclude that for Anopheles, Paris green is far cheaper than stoxal, if a dust larvicide is wanted. "For culicines, there are few places where oil or fish would not

be more economical, and in such places trioxymethylene [paraformal] alone, or diluted with some inexpensive dust ' . . should be much cheaper than, and fully as efficient as stoxal."

A. A.

BRUG (S. L.) & VAN SLOOTEN (J.). **Report of Some Experiments on the Efficiency as Insecticides of "Flit," "Rids" and of some other Preparations made at the Medical Laboratory at Weltevreden.**—*Meded. Dienst d. Volksgezondheid in Nederl.-Indië.* 1927. Part 3. pp. 524–530. [Med. Lab., Weltevreden, Java.] [Summary appears also in *Bulletin of Hygiene.*]

These insecticides, which are to be used as a spray, are effective in killing both anophelines and culicines, as well as flies. Their effect on cockroaches is doubtful and owing to their poor powers of penetration they are of little value against bed-bugs which cannot be reached in their hiding places by a spray. The sprays are superior to pure kerosene. "Flit" is not regarded as the equal of "Rids" because it stains and has an irritating effect on the skin, conjunctiva and nasal mucous membrane. "Rids" was prepared in the laboratory according to the formula—Kerosene 89·6 parts, carbon tetrachloride 7 parts and methyl salicylate 3·4 parts, and was as effective as the commercial article. The omission of the methyl salicylate does not impair the efficiency of the insecticide and it is claimed that a cheaper and simpler preparation can be obtained by mixing 2 parts of carbon tetrachloride with 100 parts of kerosene.

M. E. Delafield.

MUNRO (A. Campbell). **An Experiment in Mosquito-proofing Barracks of British Troops.**—*Jl. Roy. Army Med. Corps.* 1927. Oct. Vol. 49. No. 4. pp. 248–255. With 1 text fig.

It will probably surprise American readers of this paper that it should be necessary, at this date, to publish results demonstrating the efficacy of screening for the reduction of malaria incidence. The method has long been practised by Americans to whom the unscreened houses of the British tropics are a source of amazement. The author's results are convincing and it is to be hoped that his paper may result in the widespread adoption of this plan in British possessions. The rationale of the proceeding is obvious when it is realized (as JAMES has pointed out) that for every million mosquito larvae, there are perhaps 50 adult mosquitoes sufficiently favourably placed to become transmitters; and screening effects its results "by protecting the men *absolutely* for the majority of the dangerous hours."

J. F. C. H.

NICHOLLS (L.). **The Organisation of Minor Anti-Anopheline Field Work.**—*Ceylon Jl. Sci.* (Sect. D. Med. Sci.) 1927. Mar. 16. Vol. 2. Pt. 1. pp. 31–36. With 1 map.

This paper cannot be summarized, but it contains useful details about the personnel necessary, the mapping of areas to be dealt with, the recording of work done and of results, and the general conduct of minor antimalarial operations.

J. F. C. H.

ROUBAUD (E.). L'hétérodynamie et le rôle de l'athermobiose dans le cycle évolutif de *Phlebotomus pappatasii*. [**Heterodynamy and Athermobiosis in the Development of** *P. papatasii*.]—*Bull. Soc. Path. Exot.* 1927. July 13. Vol. 20. No. 7. pp. 613–619. With 2 text figs. [3 refs.]

According to the observations described in this paper *Phlebotomus papatasii* is quite singular in being what the author calls " heterodynamous "—i.e., in producing at one birth eggs which, when left to hatch and to continue their ontogeny, *all of them under identical conditions*, give issue, some to larvae that complete their transformation to adults in less than a month, and others to larvae that pass into a state of suspended animation in their fourth stage and are unable to continue and complete their further transformations unless, sooner or later, they are resuscitated by an interval of exposure to a temperature 12° C. (or more) below their normal optimum of 28° C.

This " heterodynamy " appears to be a variable character : since of six female *P. papatasii* kept under observation by the author two individuals gave issue to larvae all of which, at 28° C., changed to adult insects within a month ; three individuals gave issue to larvae all of which (at 28° C.) were still in their fourth, torpid, stage, at the end of four months ; and one individual gave issue to larvae of which (at 28° C.) 5 were changed into adults in a month and the others after the lapse of four months are still in the fourth, inactive, stage.

In the laboratory the fourth (torpid) larval stage was observed to last at least five months in some cases ; survivors then exposed for about a month to a temperature of 16° or 18° C. were resuscitated and completed their changes to adult insects after being returned to their optimum temperature of 28° C.

The fourth larval stage, of suspended animation, is termed by the author " asthenobiosis " ; and what goes on in the resuscitative interval of exposure to lowered temperature is termed " athermobiosis."

A. A.

SULDEY (Ed. W.). Stegomyia et Phlébotome à Bamako (Soudan). [**Stegomyia and Phlebotomus at Bamako.**]—*Bull. Soc. Path. Exot.* 1927. June 8. Vol. 20. No. 6. pp. 474–475. [1 ref.]

Since Stegomyia has been brought under complete control at Bamako in French West Africa, where —along with *Phlebotomus papatasii* and *minutus*—a non-eruptive form of dengue (not to be confused with papataci fever) exists, the author speculates on the possibility of Phlebotomus being a carrier of dengue fever.

A. A.

NITZULESCU (Virgil). Contribution à l'étude de la pompe salivaire des simulidés. [**The Salivary Pump of the Simuliidae.**]—*Bull. Soc. Path. Exot.* 1927. Oct. 12. Vol. 20. No. 8. pp. 748–753. With 1 text fig. & 4 figs. on 2 plates. [Parasit. Lab., Faculty of Med., Paris.]

A minute description of the salivary pump of Simuliidae intended to be supplementary of that given by CORNWALL in Vol. X of the *Indian Journal of Medical Research* (p. 996). The small point emphasized by the author is that the salivary pump is entirely tubular and is situated chiefly under the hypopharynx, with which it is incorporated.

A. A.

Tao (Shan Ming). **A Comparative Study of the Early Larval Stages of Some Common Flies.**—*Amer. Jl. Hyg.* 1927. Nov. Vol. 7. No. 6. pp. 735–761. With 7 plates. [42 refs.] [Sch. of Hyg., Johns Hopkins Univ., Baltimore, Md.]

This is a rigorously descriptive paper, fully illustrated, and including keys for the identification of first and second larval stages of thirteen of the commonest cosmopolitan genera of calliphorid, muscid, anthomyid, and sarcophagid flies. The author claims that the generic discrimination of these flies is thus possible without any confirmation by rearing larvae to the adult stage.

Keys to some Common Genera of the Families Calliphoridae, Muscidae, Anthomyidae, and Sarcophagidae

First larval stage.

1. Larvae of normal muscoid shape without processes or appendages 2
   Larvae with processes or appendages 13
2. Having more than six complete spinose rings 3
   Having not more than one complete spinose ring 10
3. Having complete spinose rings on all segments except the first and the last, either on anterior or on posterior edges ... 4
   Not more than nine complete spinose rings, all on anterior edges of segments 6
4. All the spines chitinized 5
   Not all the spines chitinized 9
5. Mandibular sclerites composed of two lateral hooks, no denticles *Sarcophaga*
   Mandibular sclerites composed of one median hook and denticles ... ... *Calliphora*
6. Denticles composed of a group of tooth-like structures and a pair of long sclerites 7
   Denticles composed of a group of tooth-like structures only ... 8
7. Lateral plate of pharyngeal sclerites very narrow, anterior ends of hypostomal sclerites straight... ... ... *Lucilia*
   Lateral plate of pharyngeal sclerites broad, anterior ends of hypostomal sclerites bend sharply dorsally ... *Protophormia*
   Lateral plate of pharyngeal sclerites very broad, anterior ends of hypostomal sclerites straight ... ... *Cochliomyia*
8. Posterior end papillated, six tubercles on each lip ... *Cynomyia*
   Posterior end not papillated, no tubercles on upper lip, but four very small inconspicuous tubercles on lower lip... *Phormia*
9. A complete chitinized spinose ring at the middle of the eleventh and twelfth segments ... ... *Pollenia*
10. Posterior end round and smooth ... ... *Musea*
    Posterior end papillated 11
11. Lateral plate of pharyngeal sclerites broader dorso-ventrally than antero-posteriorly 12
    Lateral plate of pharyngeal sclerites broader antero-posteriorly than dorso-ventrally ... ... *Stomoxys*
12. Denticles around the mouth coarse ... ... *Muscina*
    No denticles around the mouth ... ... *Ophyra*
13. Posterior spiracles on a pair of short separated tubercles ... 14
14. Appendages of spiniferous type ... ... *F. canicularies*
    Appendages of pinnate type ... ... *F. scalaris*

Second larval stage.

1. Larvae of normal muscoid shape without processes or appendages 2
   Larvae with processes or appendages 11

2. Dorsal cornua of pharyngeal sclerites deeply incised posteriorly *Sarcophaga*
   Dorsal cornua of pharyngeal sclerites not incised 3
3. Dorsal arch of pharyngeal sclerites porous and with uneven edges 7
   Dorsal arch of pharyngeal sclerites not porous and with even edges 4
4. Complete spinose rings on posterior ends of segments 8–12 or 7–12 ... ... *Cynomyia, Calliphora*
   Not more than 3 caudal segments with complete spinose rings 6
   No complete spinose ring on posterior end of any segment ... 5
5. Posterior end non-papillated, some spines with swollen ring near the tip ... ... *Cochliomyia*
   Posterior end papillated, spines without swollen ring near the tip ... ... *Phormia*
6. Posterior spiracles narrower transversely than longitudinally, the distance between the two spiracles greater than the width of one of the spiracles ... ... *Lucilia*
   Posterior spiracles broader transversely than longitudinally, the distance between the two spiracles less than the width of one of the spiracles ... ... *P. otophormia*
7. Posterior end smooth, rounded 8
   Posterior end papillated or rough 9
8. Mandibular sclerites composed of three pairs of long, slender, hooked sclerites ... ... *Musca*
9. Lateral plates very broad; ventral cornua twice as long as dorsal cornua ... ... *Stomoxys*
   Lateral plates narrow; ventral cornua slightly shorter than dorsal cornua 10
10. Lateral hooks bend ventrally at the posterior ends forming a right angle ... ... *Ophyra*
    Lateral hooks formed by two long parallel sclerites with their posterior ends articulated to a short transverse sclerite *Muscina*
11. Posterior sclerites on a pair of short separate tubercles... ... 12
12. Appendages of spiniferous type ... ... *F. canicularis*
    Appendages of pinnate type ... ... *F. scalaris*

A. A.

Charrier (H.). Note préliminaire sur les mouches de la région de Tanger. [**The Flies of the Tangiers Region.**]—*Bull. Soc. Path. Exot.* 1927. July 13. Vol. 20. No. 7. pp. 619–622. [2 refs.] [Pasteur Inst., Tangiers.]

Along with some remarks on the deplorable insanitary conditions of Tangier this paper contains a list of 18 species of domestic muscoid flies, exclusive of the Calliphorids and Sarcophagids, that flourish there under those conditions.

A. A.

Laidler (P. W.). **An Unusual Case of Myiasis in a European Male.**—*Jl. Med. Assoc. S. Africa.* 1927. Sept. 10. Vol. 1. No. 17. p. 452.

The poor wretch in this case was one of the most deplorable objects to be seen in a land where tradition has hedged the white man with a sort of divinity among a native population—namely, a worn-out European tramp. He had found his way to a Salvation Army Hostel, only to pollute the air, and almost to choke pity, by the awful stench that presently was found to emanate from a leg exuding maggots. When hundreds of maggots had been cleared away their source was traced to three deep wounds in the shin; and all that could be elicited as to the origin of these wounds was

that, about a month previously, the man had felt some itching of the leg which he had sought to relieve by scratching. About 16 days after that, he had noticed a maggot, but without any concern then or afterwards; and he was the only person unperturbed by the pervading stench and by the seething mass of maggots exposed when his leg was bared. He "died as the result of his general condition four days later." The flies, bred from maggots by Mr. R. H. Harris, were identified by Mr. H. K. Munro as *Chrysomyia chloropyga* and *C. marginalis*.

A. A.

Kislitschenko (L.) & Baranoff (N.). Fliegenmaden als Wundenschmarotzer in Süd-Serbien (Mazedonien). [**Fly Larvae as Wound Parasites in Macedonia.**]—*Dermat. Woch.* 1927. Aug. 20. Vol. 85. No. 34. pp. 1169–1172. With 3 text figs. [5 refs.]

A case of extensive myiasis of the scalp by maggots of the Sarcophagid fly *Wohlfartia magnifica* is figured. Two other cases of surgical myiasis are mentioned in one of which the maggots were those of *Lucilia sericata*, in the other both *W. magnifica* and *L. sericata*. The hypopygium in both species of flies is figured.

A. A.

Comer (M. C.). **Report of Six Unusual Cases.**—*Southwestern Med.* 1927. July. Vol. 11. No. 7. pp. 308–312. With 2 text figs. [5 refs.]

Case No. I. Screw-Worm Infestation of the Nares. A workman asleep in the open during the mid-day dinner-hour was awakened by a violent fit of sneezing. Next day he went to hospital complaining of blocking of the nostrils and intense frontal headache. There was also a foetid sero-sanguinolent discharge from the nose, and maggots could be made out. Chloroform on cottonwool was applied to the nostrils and 130 screw-worms were removed at once; 45 more came away during the next 3 or 4 days. The maggots had already eaten through the nasal septum. The nasal cavity was irrigated with potassium-permanganate solution, and the patient discharged at the end of another week.

A. A.

Stroud (R. J.). **Myiasis in the Southwest, with Particular Reference to the Species** *Chrysomyia macellaria.*—*Southwestern Med.* 1927. July. Vol. 11. No. 7. pp. 313–316. With 3 text figs. [8 refs.]

In the course of 13 years the author has had to treat 16 cases of myiasis due mostly to "screwworm" (*Chrysomyia macellaria*); 14 were nasal, and in Mexicans, whose habit it is to sleep in the open and often in the daytime; one of these was fatal, by meningitis. The author emphasizes the necessity of early diagnosis, because the eggs hatch and the maggots grow very quickly; the evil stench is diagnostic, apart from the detection of maggots. His treatment is by chloroform douches, followed by simple douches and the use of forceps, and then leaving the nostrils plugged for a time with cotton-wool impregnated with chloroform; he states that carbon tetrachloride is just as effective, and he recommends it for children.

In an ensuing discussion all the speakers commented on the neglect of this subject in the standard text-books. One speaker mentioned 23 cases, with 4 fatalities, collected by him; another suggested suction apparatus for removal of maggots; another stated—in terms not so

entirely perspicuous as to be obviously relevant—that during the war, although there were many cases of gas-gangrene among the wounded not one was observed in any " patient who was infected with worms."

A. A.

Falcão (Edgard de Cerqueira). Myiase palpebral determinada pela " Dermatobia cyaniventris " Macquart, 1840. [**Palpebral Myiasis caused by** *Dermatobia cyaniventris*.]—*Brasil-Medico.* 1927. Oct. 1. Vol. 41. No. 40. pp. 1038–1042. [9 refs.]

Case of ptosis and swelling of the right eyelid which had started with itching and pain some three weeks previously. Incision evacuated a larva of *Dermatobia cyaniventris*. The wound was treated and healed in 10 days.

H. Harold Scott.

Rennie (John). **A Case of Intestinal Myiasis in a Breast-Fed Infant.**—*Parasitology.* 1927. Aug. Vol. 19. No. 2. pp. 139–140. [6 refs.] [Univ. Aberdeen.]

In this case " a fair number " of last-stage larvae of *Musca domestica* were found, incorporated with faeces passed on its napkin by a four-months-old infant that, except for sugar given on a teat, was fed at the breast. A fresh napkin had been affixed about half-an-hour before the observation was made, and the observer's attention was attracted by the infant's outcry. There had been no earlier indication of gastro-intestinal trouble. The infant was " but moderately clean " and at times had an offensive odour. " The dwelling was most insanitary." Though it was winter (8th Feb.) and so far north as Aberdeen, flies were numerous in the rooms.

A. A.

Nieschulz (Otto). Ueber die Lebensdauer der Tabaniden. (Zoologische Beiträge zum Surraproblem Nr XII.) [**The Life-Span of Tabanidae.**]—*Cent. f. Bakt.* I. Abt. Orig. 1927. Sept. 10. Vol. 103. No. 6-8. pp. 421–423. [Veter. State Inst., Buitenzorg, Java.]

In the course of surra experiments with *Tabanus rubidus* and *striatus* reared in the laboratory the author observed that adult females could live in captivity for more than 70 days, sucking blood under unrestricted opportunity about every two days.

A. A.

Lloyd (Llewellyn). **Report of the Tsetse Investigation, 1926.**—*Ann. Med. & San. Rep. Nigeria. 1926.* Appendix C. pp. 176–184. With 6 figs. on 2 plates.

This report has already been noticed here (Vol. 24, p. 891). It recounts : (1) an experiment in excluding game from a good " secondary focus " of *morsitans* and *tachinoides* ; (2) an observation of the results of " late " grass-burning, and (3) the beginnings of an experiment in clearing and settlement.

The exclusion of game was followed by a local decrease in the numbers of tsetse-flies, not so much in *tachinoides* as in *morsitans*, since the former feeds well on reptiles which are not easy to exclude. The late grass-burning was followed immediately by a great mortality of flies (both adults and pupae) but the numbers soon began to increase again by immigration. In clearing, the main breeding-foci whence the fly spread abroad during the rains are being attacked. The report contains some very nice photographs.

A. A.

Schwetz (J.). Notes sur la répartition actuelle (en 1925 et 1926) des glossines dans plusieurs régions du Katanga. [**Notes on the Distribution of Tsetse in Districts of the Katanga.**]—*Ann. Soc. Belge de Méd. Trop.* 1927. Nov. Vol. 7. No. 2. pp. 111–134. With 1 folding map. [10 refs.]

The general distribution of tsetse-flies in Katanga is well known; but the present paper with all its discriminative local particularities has still some lessons of general interest. The chief object lesson is the retreat of fly before the hurlyburly innovations of European settlement—the clearing of land, and the smoke and noisy traffic that drives the big game away. *Glossina morsitans* is not now to be seen within a radius of 30 kilometres from Elizabethville (and is practically extinct along the entire route from that town to Likasi) and the nearest approaches of *G. palpalis* are at 110 to 150 kilometres. The same pushing away of the fly is noticed roundabout other townships—Likasi, Kambove, and Albertville. The author greatly emphasizes the effects of disappearance of big game.

A. A.

Johnson (W. B.) & Rawson (P. H.). **Use of the Precipitin Test to determine the Food Supply of Tsetse Flies: a Preliminary Note.**—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1927. Aug. 31. Vol. 21. No. 2. pp. 135–149. [4 refs.]

The authors attempted the work here recorded in a bush laboratory, and found it difficult to prepare and to keep their antisera without ice. They did, however, make some interesting tests. As they found that the average quantity of 1/500 serum-dilution available from a single tsetsefly-stomach is only 3 cc. which, using 0·3 cc. for each test (and for 1 control), is only sufficient to put up against 9 antisera, they devised a plan for limiting the number of antisera against which each blood had to be tested, by first determining whether the blood belonged to the small-erythrocyte group (which includes ruminants and wild cats) or the large-erythrocyte group (which includes man and a variety of non-ruminants). In one series of tests 8 *G. tachinoides* and 7 *G. morsitans* containing blood of the large-erythrocyte type were tested against conformable antisera: of the *G. tachinoides*, 6 gave a positive reaction for man, 1 for hyaena, and 1 for rodent; and of the *G. morsitans*, 5 gave a positive for man, and 2 were negative for all the antisera (man, monkey, donkey, jackal, hyaena, warthog, rat and hedgehog). In another series of tests of 679 *G. tachinoides* examined, 1·5 per cent. were positive for man, 2·5 per cent. positive for baboon, and 0·3 per cent. positive for monkey; and of 2,408 *G. morsitans*, 0·4 were positive for man, and 0·3 positive for baboon. It is thus shown that a large number of baboons in a locality assures the food-supply both of *tachinoides* and of *morsitans*.

The authors conclude that since blood taken from a fly's stomach on a strip of filter-paper keeps good for a long time, it should in this way be collected in the field and afterwards tested in a properly equipped laboratory where antisera can be prepared and stored. [This is also the experience of Bull and King, with whose work on the use of the precipitin test for discriminating the blood in anopheline stomachs (*American Journal of Hygiene*, September, 1923, pp. 491–496; *v.* this *Bulletin*, Vol. 21, p. 143), the authors appear to be unacquainted.]

A. A.

Jorge (Ricardo). Les faunes régionales des rongeurs et des puces dans leurs rapports avec la peste. [**Regional Faunas of Rodents and Fleas in their Relation to Plague.**]—*Bull. Office Internat. d' Hyg. Publique.* 1927. Aug. & Sept. Vol. 19. Nos. 8 & 9. pp. 1094–1109; 1257–1288. [3 refs.]

This convenient compilation is an abridgement and abstract of the authentic knowledge accumulated in various countries, in recent times, of specific rodents and rodent-fleas in so far as they are identified with the maintenance of plague as a regional enzoic or obscure endemic disease and with the distant carriage of plague and its discrimination in epizootics, culminating in epidemics, in populous centres. In the author's words, it is " an essay on rodentology and pulicology for the use of those who are concerned in pestology."

A. A.

Clark (Taliaferro). La faune des rongeurs et de leurs parasites cutanés qui interviennent dans la propagation de la peste. [**Rodents and their Plague-carrying Skin Parasites.**]—*Bull. Office Internat. d' Hyg. Publique.* 1927. Aug. Vol. 19. No. 8. pp. 1129–1132.

This note deals with the general principles of plague quarantine so far as rat-fleas are concerned. It also states that the Public Health Service of the U.S.A. continued the survey of the rat-fleas of the port of New York begun in 1925. In 1926 the number of fleas taken from 12,808 dead rats was 6,274, of which 5,521 were *Xenopsylla cheopis*; 4 *X. brasiliensis*; 27 *X. astia*; 653 *Ceratophyllus fasciatus*; 54 *Leptopsylla musculi*; 9 *Ctenocephalus canis* or *felis*; 1 *Pulex irritans*; and 5 not identified.

A. A.

Sinton (J. A.). **The Indian Rat Fleas, with Special Reference to the Identification of the " Plague Fleas."**—*Indian Jl. Med. Res.* 1925. Jan. Vol. 12. No. 3. pp. 471–478. With 15 figs. on 2 plates. [5 refs.]

This useful compilation contains keys for the discrimination of genera and certain important species of rat-fleas, and an account of Cragg's ways of collecting and mounting fleas.

A. A.

Mital (B. P.). Sur la distribution géographique et la prévalence saisonnière des rats et puces de rats dans les Provinces-Unies. [**Geographical Distribution and Seasonal Prevalence of Rats and Rat Fleas in the United Provinces.**]—*Bull. Office Internat. d' Hyg. Publique.* 1927. Aug. Vol. 19. No. 8. pp. 1110–1128.

This report represents the results of a year's survey. The number of fleas collected (from 2,558 rats) was 15,118. The species of fleas were *Xenopsylla astia*, 53·5 per cent. of the total, *X. cheopis* 42·3 per cent., Ceratophyllus 3·5 per cent., and severally in small number *Ctenocephalus canis* and *felis*, *Pulex irritans*, *Ctenopsylla* and *Hoplopsyllus*. *X. astia* (rare in hilly tracts) was taken in increased numbers in April, June, and September. *X. cheopis* was most abundant during the rainy season.

Ceratophyllus was found most in the western districts of the United Provinces. A tabular statement shows the percentages of the several species of fleas collected in 48 large towns along with the intensity of plague for 23 years in each of those towns. The results of the survey do not altogether confirm the theory that liability to epidemics of plague depends on predominance of *X. cheopis* ; the author mentions several districts—including Kumaon, Dehra Dun, Philibit—which have been little troubled by plague although *X. cheopis* is the predominant species ; and he contrasts Gorakhpur, with its 71·2 per cent. of *X. cheopis* and its 2·12 per mille plague mortality (for 23 years) with Ballia where the percentage of *X. cheopis* was 68·2 and the plague mortality (23 years) was 12·52 per mille.

A. A.

Barraud (P. J.). **A Note on Rat Fleas collected in Assam.**—*Indian Jl. Med. Res.* 1927. Oct. Vol. 15. No. 2. pp. 519–521. [4 refs.] [Central Research Inst., Kasauli, India.]

In a by-path from other cognate work the author collected 153 fleas from 17 rats in Gauhati and obtained otherwise 62 rat-fleas from Shillong ; all of them but one were *Xenopsylla cheopis*, the solitary exception (in Gauhati) being *X. astia*.

A. A.

Ioff (I.). Materialen zum Studium der Ektoparasitenfauna im S.-O. Russlands. IV. Flöhe der Murmeltiere (Marmota) und der Gelbziesel (*Citellus fulvus*). [**Marmot and Ziesel Fleas.**]—*Rev. Microbiol. et Epidémiol.* 1927. Vol. 6. No. 3. German summary pp. 378–380. [In Russian pp. 316–323. With 3 text figs. 13 refs.]

An entomological paper containing notes and figures of male genitalia of 2 spp. of Oropsylla from marmot and ground-squirrel respectively, and mention of five other spp. of fleas taken from other local rodents.

A. A.

Nitzulescu (Virgil). Sur le stylet médian de l'appareil buccal de la puce. [**The Median Stylet of the Buccal Apparatus of the Flea.**]—*Bull. Soc. Path. Exot.* 1927. June 8. Vol. 20. No. 6. pp. 467–473. With 3 text figs. [13 refs.]

From longitudinal and serial sections the author concludes that the median stylet of the proboscis of the flea is the epipharynx ; its canal is closed distally. Saliva is introduced by the mandibles.

A. A.

Perfiliew (P.). Zur Anatomie der Flohlarven. [**Anatomy of Flea Larvae.**]—*Rev. Microbiol. et Epidémiol.* 1927. Vol. 6. No. 3. German summary p. 381. [In Russian pp. 329–341. With 20 text figs. 13 refs.]

Merely describes the mouth-parts and (with figures) the anatomy, as studied in sections, of the flea larva as exemplified in *Leptopsylla pavlovskii* : nothing novel.

A. A.

Kelsall (R.). **A Case of sweating Blood.** With Note by Major G. G. Jolly.—*Indian Med. Gaz.* 1927. Oct. Vol. 62. No. 10. pp. 565–566. [1 ref.] [Rangoon General Hosp.]

The " sweating " of blood in this case was found to be due to the Sarcopsyllid flea *Echidnophaga gallinacea*. The patient, a Mahomedan lady, was tenderly attached to some chickens, which she was accustomed to cherish in her bosom ; the chickens were infested with these fleas, and some of the fleas transferred their attention to the lady.

A. A.

Pavlowsky (E. N.) & Stein (A. K.). Altérations pathologiques de la peau humaine déterminées par l'action des poils vénimeux de la chenille hibernante d'*Euproctis chrysorrhoea*. [**Pathological Changes in the Human Skin from the Action of Poisonous Hairs of** *E. chrysorrhoea* Larva.]—*Russian Jl. Trop. Med.* 1927. Vol. 5. No. 7. French summary pp. 469–470. [In Russian pp. 445–448.]

According to the French summary the irritant hairs of the caterpillar of *Euproctis chrysorrhoea* cause a local inflammatory oedema with points of inflammatory infiltration where the hairs penetrate the skin.

A. A.

Dallas (E. D.). Eritema generalizado producido por un lepidóptero. [**Generalized Erythema produced by a Lepidopteron.**]—*Semana Méd.* 1927. Mar. 24. Vol. 34. No. 12 (1732). p. 760. With 1 text fig.

A woman of 25 years felt a sudden burning sensation on the right arm and saw a " small dark insect " which she brushed off without further attention ; after a few minutes itching, an erythematous morbilliform eruption appeared and spread rapidly up the arm and over the thorax and abdomen. There were no other symptoms of any sort. The insect proved to be *Hylesia nigricans*, the larva of which is the " bicho quemador " (" burning grub ").

H. Harold Scott.

Mazza (Salvador). Necrosis considerable producida por picadura de araña migalomorfa. [**Extensive Necrosis from the Bite of an Arachnid.**]—*Bol. Inst. Clin. Quirurg.* Buenos Aires. 1927. Vol. 3. Nos. 21–25. pp. 767–769. With 1 text fig. [3 refs.] [Also issued as 3ª *Reunión, Soc. Argentina Patol. Regional del Norte, Tucumán, Julio, 7, 8 y 10, 1927.* pp. 659–661 & illustration.]

The spider in question is said to be a " veritable giant among Arachnida " ; some admit that its poison is very potent for reptiles and batrachia, but debate its effect on mammalia. The patient here was seen ten days after the infliction of the bite, now indicated by a large black eschar in a carbuncle, the whole as " large as the head of an adult man." Treatment (with aristol) left a cavity the size of a goose egg. The general state of the patient was not, strange to say, disturbed. If treated early, a specific antiserum is said to be very efficacious.

H. Harold Scott.

Dunn (Lawrence H.). **Studies on the South American Tick, *Ornithodoros venezuelensis* Brumpt, in Colombia. Its Prevalence, Distribution, and Importance as an Intermediate Host of Relapsing Fever.**—*Jl. Parasit.* 1927. June. Vol. 13. No. 4. pp. 249–255. [International Health Board, New York.]

Ornithodorus venezuelensis is a common house-tick of Colombia; no less than 4,880 were collected in sixty-eight houses in different villages and towns of that country. Of sixty-one lots of ticks, 27·86 per cent. of the individual ticks, representative of seventeen houses in seven different localities, were found to be infested with the spirochaetes of relapsing fever. Three lots of ticks, kept closely confined without nourishment, were potentially infective at the end of 172 days.

A. A.

Pawlowsky (E. N.) & Stein (A. K.). Experimentelle Untersuchungen ueber die Wirkung von *Ixodes ricinus* (Ixodidae) auf die Menschenhaut. [**Experimental Investigation of the Action of *I. ricinus* on the Human Skin.**]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1927. Dec. Vol. 31. No. 12. pp. 574–586. With 8 text figs. [19 refs.]

The anatomy of the salivary glands of the tick is figured and is described in much detail. Results of experiments with emulsions of them, and also of the stomach and rectum, are tabulated; the salivary secretion alone caused a pustule on the skin; the other organs merely provoked varying, non-specific, inflammatory phenomena. In the saliva, besides the anticoagulin, there is a strongly specific toxin, and the authors think it probable that the virulence of this toxin varies in the different stages, and at different times in each stage, of the tick's development.

A. A.

King (Harold H.). **The Ticks (Ixodoidea) of the Sudan.**—*Sudan Government. Wellcome Tropical Research Laboratories. Entomological Section Bull. No. 23.* 1926. Dec. 15 pp. With 1 map & 20 figs. on 1 folding plate.

This useful pamphlet is compiled for the benefit of local officials who wish to identify the local ticks.

A. A.

Gough (L. H.). **Key to Identification of Egyptian Scorpions.** With Notes and Additions by Hirst (Stanley).—*Ministry of Agric. Egypt. Technical & Scientific Service. (Plant Protection Section, Entomological Res. Division). Bull. No. 76.* 7 pp. With 9 figs. 1927. Cairo: Govt. Press. [P.T. 5.]

This pamphlet, which can be obtained from the Government Publications office, Ministry of Finance, Dawâwin P.O., Cairo, contains a key for the identification of the scorpions (14 species) recorded from Egypt. The key is conveniently based on characters of the poison-sting and the segment immediately preceding it. With these parts, properly sun-dried, the production of accurately specific antisera can be achieved with a minimum difficulty of transport, etc., in the case of Egyptian scorpions.

A. A.

KOPSTEIN (F.). **The Poisonousness of the Javanese Giant Scorpion** *Heterometrus cyaneus.*—*Meded Dienst d. Volksgezondheid in Nederl.-Indië.* 1927. Part 3. pp. 504–513.

This paper describes some simple experiments with the venom of the large Oriental scorpion *Heterometrus cyaneus*. Small birds (Java sparrows and weaver-birds) were fatally convulsed, and insects and earthworms and a small gecko were fatally paralysed ; but to mammals even so small as rats the venom of a single scorpion did not cause much distress, or much injury except in some rats occasionally a necrosis at the site of injection. Frogs, a toad, a tortoise, and a venomous snake (*Bungarus candidus*) appeared quite immune, as did the specific scorpion itself. The toxic property is almost entirely destroyed by heating to 50° C. for 5 minutes.

A. A.

SAGREDO (N.). Linguatula-rhinaria-Larva (*Pentastoma denticulatum*) in den Lungen des Menschen. [**Larvae of** *P. denticulatum* **in Human Lung.**]— *Virchows Arch. f. Path. Anat. u. Physiol.* 1924. Vol. 251. pp. 608–615. With 4 text figs. (1 coloured). [20 refs.]

The point of this long story is that few observers have encountered the larva of *Pentastoma denticulatum* in the human lung and none have discovered its pathological significance for man. The author however, in the course of a post-mortem examination (on a fatal case of encephalitis lethargica) observed this larva in a fresh haemorrhagic infarct of the lung—the lungs being otherwise normal. He describes and figures this infarct and the larva and concludes that the latter is undoubtedly pathogenous.

A. A.

SONOBE (Koichi). Ueber Linguatuliden-Larven-Knötchen (sog. Pentastomen-Knötchen) der Leber des Menschen. Nebst Bemerkungen zu der Veröffentlichung von N. Sagredo in Bd.251 Virchows Archivs. [**On Linguatulid-Larval-Nodules (so called Pentastoma Nodules) of the Liver in Man.**]—*Sei-I-Kwai Med. Jl.* 1927. July. Vol. 46. No. 7. pp. 1–13. [31 refs.] [Municipal Urban Hosp., Berlin.]

With reference to SAGREDO'S conclusions this author states that in the course of 500 post-mortem examinations in Berlin he observed the larva of *Linguatula rhinaria* (= *Pentastoma denticulatum*) in the liver in 16 instances. In every case the larva was encysted, dead, and calcified. For man this larva has no pathological import.

In feeding experiments with white mice in S. America the author noted the death of the mice 29 to 64 days after eating eggs from Linguatulids of snakes. The usual cause of death was haemorrhage into the thoracic or the abdominal cavity, where also the free Linguatulid larvae could be found. The larvae were present oftenest in the lungs, then in the parietal peritoneum, mesentery, liver, spleen, and kidneys— in that order.

[Hospital cases of death consequent on *heavy* infestation of the viscera with larvae of Porocephalus have been reported from French West Africa—*vide* this *Bulletin*, Vol. 20, p. 418.]

A. A.

Faust (Ernest Carroll). **Linguatulids (Order Acarina) from Man and Other Hosts in China.**—*Amer. Jl. Trop. Med.* 1927. Sept. Vol. 7. No. 5. pp. 311–325. With 1 text fig. & 14 figs. on 2 plates. [13 refs.] [Peking Union Med. College, Peking, China.]

Four species are included in this paper, all being represented by nymphs —namely, *Armillifer moniliformis*, from liver of man; *Linguatula serrata*, from lung of rabbits; *Kiricephalus pattoni*, from lung of cat; and *Reighardia sternae* from the lung and portal blood of a tern.

A. A.

Hansen (I.). [**A Case of "Larva Migrans."**]—*Ugeskrift f. Laeger.* Copenhagen. 1927. Apr. 14. Vol. 89. p. 298. [Summarized in *Jl. Amer. Med. Assoc.* 1927. July 23. Vol. 89. No. 4. p. 334.]

This case affected the ankle of a Siamese woman. The only specific detail here given is that the track of the larva, which was marked by discolouration of the skin, advanced "several centimetres" a day.

A. A.

Cilento (R. W.). **Larva Migrans** (*Myiasis linearis*) **occurring in the Territory of New Guinea.**—*Med. Jl. Australia.* 1927. Oct. 29. 14th Year. Vol. 2. No. 18. pp. 614–615. With 1 text fig.

Larva migrans, or "creeping eruption," is known to be a vague term for a phenomenon of varied causation. In the present novel case—a young European child in New Guinea—the eruption appears to have been caused by a mite, or mites, of the genus *Rhizoglyphus*—mites that burrow in roots and bulbs.

A. A.

Bulletin of the Antivenin Institute of America. Philadelphia, Pa., 1927. Mar. & July. Vol. 1. Nos. 1 & 2.

These two initiative numbers of the *Bulletin of the Antivenin Institute of America* contain two compilations of a semi-popular kind on the poisonous snakes of the U.S.A., two articles on the well-known principles of treatment of snake-bite, some brief abstracts of cases of snake-bite treated with antibothropic serum in hospitals of the United Fruit Company, and numerous articles—descriptive and taxonomic—that are of interest only to those who have to deal with systematic herpetology. A short article by P. J. Darlington states that the colubrine snake *Tropidophis semicinctus*, when offended, emits a very offensive fluid from the cloacal orifice and at the same time exudes blood from the mouth.

The editors' statement, that the subject-matter of their new Bulletin is of a kind that hitherto has received little attention within their own geographical range, will cause surprise to those who remember that the classical studies of Weir Mitchell and of Sewall on rattlesnake venom, were the starting-points of our knowledge, respectively, of snake-toxins and the acquisition of immunity to them.

A. A.

Nechkovitch (Miloutine). Action du venin de cobra sur les animaux en état d'hypoglycémie insulinique. [**Action of Cobra Venom on Animals Hypoglycaemic from Insulin.**]—*C.R. Soc. Biol.* 1927. Nov. 11. Vol. 97. No. 30. pp. 1304–1305. [1 ref.] [Physiol. Inst., Faculty of Med., Belgrade.]

Experimenting with rabbits the author finds that the neurotoxic (paralysing) action of cobra venom is not affected by a state of hypoglycaemia. In this respect cobra-neurotoxin differs from curari, a lethal dose of which falls short of its effect in a hypoglycaemic rabbit.

A. A.

Carmichael (Emmett B.). **Detoxification of Rattlesnake Venom by Sodium Ricinoleate.**—*Jl. Pharm. & Experim. Therap.* 1927. Oct. Vol. 31. No. 6. pp. 445–454. [7 refs.] [College of Med., Univ. of Cincinnati, Ohio.]

The author recounts in very full technical detail the experimental evidence that rattlesnake venom subsequent to admixture with sodium ricinoleate can be injected into a rabbit in estimated lethal doses without causing death ; and he also states that an aqueous solution of 0·15 gm. of sodium ricinoleate if injected into a rabbit, within about 30 seconds—and at the identical spot—subsequent to a lethal dose of rattlesnake venom, can save the animal at the price of a local ulcer.

A. A.

Much, Peemöller & Haim. Lichtwirkung und Kobragift. [**Action of Light on Cobra Venom.**]—*Muench. Med. Woch.* 1927. Aug. 12. Vol. 74. No. 32. pp. 1365–1366. [Immunol. Inst., Univ., Hamburg & Light Research Inst. Hamburg, Eppendorf.]

This paper concerns the question whether various radiations are able to alter the activity of a reagent or the response of a reacting body.

Haim and Ismet, in 1924, observed that the radiation of lipoids increased their power as antigenic substances and the fact that different kinds of radiation have different effects suggested a means for the measurement of the biological activity of X-rays.

Lipoids have an important significance in vital processes. Their function in the haemolysis of red blood corpuscles by cobra venom led to the use of this reaction as a method for assessing the effect of light on the haemolytic power of the venom. The authors found that it is possible to destroy this power totally by the light of the mercury vapour lamp. The cobra venom was used in a dilution of 1:2000; placed within an ice-cooled quartz vessel it was exposed to the lamp at a distance of half a metre to a dose equivalent to 72 times that required to cause erythema of the skin. Such irradiated venom failed to induce haemolysis.

Further work is promised upon the effect of radiated and unirradiated lecithin and cholesterin upon the biological effects of venom solutions. The authors have also shown that the toxicity of cobra-venom to white mice is cancelled by radiation and foresee a method of prophylaxis by treatment with snake poison whose activity has been reduced by radiation and perhaps combined with irradiated lipoids such as cholesterin or lecithin.

R. G. Bannerman.

MacInnes (A.); Pern (Sydney); MacPherson (John); Palmer (Arthur). **Snake Bite.** [Correspondence.]—*Med. Jl. Australia.* 1927. July 2. 14th Year. Vol. 2. No. 1. pp. 33–35.

This correspondence about snake-bite and its treatment, which for some months past has been carried on in the *Medical Journal of Australia*, for the most part with pathetic indifference to the existence of the large body of exact knowledge—a veritable canon—of that subject, is here appropriately concluded by a critical letter from Dr. Arthur Palmer, who states his opinion that even the fine experimental work of C. J. Martin and F. Tidswell on the venomous snakes of *Australia* "is not well enough known to medical men."

A. A.

Otto (R.). Zur Serumtherapie bei Bissen durch europäische Vipern. [**Serum Therapy of Bites of European Vipers.**]—*Klin. Woch.* 1927. Oct. 8. Vol. 6. No. 41. pp. 1948–1950. ["Robert Koch" Inst., Berlin.]

The statements of Kraus (and others) as to the potency of South American *Lachesis jararaca* antivenom and antibothropsserum to neutralize the venom of the European viper have induced the author to study the influence upon European viper-venom of Oriental polyvalent antivenom elaborated in Java; this he finds to be very slight.

A. A.

Sordelli (A.) & Pacella (G.). Quelques considérations sur le titrage du sérum anti-ophidien. [**Considerations on the Titration of Snake Antivenom.**]—*C.R. Soc. Biol.* 1927. Nov. 4. Vol. 97. No. 29. pp. 1246–1248. [Bact. Inst. Dept. Nat. Hygiene, Buenos Aires.]

The exact experiments with different samples of venom of *Lachesis alternatus* here briefly described show that it requires different doses of the same identical antivenom to neutralize the minimum lethal dose of different individual venoms of that species. [Since it has long been known, in a general way, that the quality of the venom of an individual snake varies, like the quality of our own secretions, with circumstances organic, seasonal, and environmental, these exact observations through interesting are not astonishing]. The authors however, would impart materialistic exactitude to their results by supposing that each assumed toxic component of a snake's venom gives origin to a corresponding antitoxin, and that the several antitoxins exist in different concentrations in each antivenom. This latter hypothesis, however, is based on experiments where the neutralizing power of different specimens of antivenom upon different individual venoms is compared.

A. A.

Chodoukine (N. I.). Sur la biologie des anopheles hibernantes et sur son rôle dans l'épidémiologie et la lutte antipaludique au Turkestan.—*Russian Jl. Trop. Med.* 1927. Vol. 5. No. 8. French summary p. 534. [In Russian pp. 502–512. 9 refs.]

Health Bulletin, No. 13. Malaria Bureau No. 5. 15 pp. With 3 figs.—Instructions for Collecting and Forwarding Mosquitoes. 1927. Calcutta: Government of India Central Publication Branch.

Koidzumi (M.). On the Distribution of Anophelines in Formosa.—*Taiwan Igakkai Zasshi* (*Jl. Med. Assoc. Formosa*). 1927. Nov. No. 272. English summary p. 1. [In Japanese.]

Koidzumi (M.). Considerations on Practice of Antilarval Work for Prevention of Malaria in Formosa.—*Taiwan Igakkai Zasshi* (*Jl. Med. Assoc. Formosa*). 1927. Nov. No. 272. English summary p. 1. [In Japanese.]

Lima (A. da Costa). Sur la respiration des larves d'*Anopheles albimanus* Wied.—*C.R. Soc. Biol.* 1927. Oct. 21. Vol. 97. No. 27. pp. 1092–1093. [" Oswaldo Cruz " Inst., Rio de Janeiro.]]

Mételkine (A.). Action du refroidissement, de la surfusion et de la congelation sur les trypanosomes.—*Russian Jl. Trop. Med.* 1927. Vol. 5. No. 8. French summary pp. 501–502. [In Russian pp. 487–501. 17 refs.]

Peterman (M. G.). Pathogenic Giardiasis in Children.—*Jl. Lab. & Clin. Med.* 1927. Oct. Vol. 13. No. 1. pp. 75–76. [4 refs.] [Milwaukee Children's Hosp., Milwaukee, Wis.]

Puri (I. M.). A Note on the Full-Grown Larvae of *Anopheles jamesii* Theobald, *A. juliginosus* Giles, *A. pallidus* Theobald and *A. ramsayi* Covell (Culicidae, Diptera).—*Indian Jl. Med. Res.* 1927. Oct. Vol. 15. No. 2. pp. 511–517. With 19 figs. on 2 plates. [11 refs.] [Central Research Inst., Kasauli, India.]

Root (Francis Metcalf). Studies on Brazilian Mosquitoes. III. The Genus Culex.—*Amer. Jl. Hyg.* 1927. Sept. Vol. 7. No. 5. pp. 574–598. With 24 figs. on 6 plates. [8 refs.]

Russell (Helen). Notes on the Reaction of the Breeding Places of Anophelines in Macedonia.—*Bull. Entom. Res.* 1927. Dec. Vol. 18. Pt. 2. pp. 155–158. With 1 map in text. [13 refs.]

LABORATORY REPORTS.

TANGANYIKA TERRITORY. **Annual Report of the Bacteriological Laboratory at Dar Es Salaam for the Year ending 31st December 1925.** [CORSON (J. F.).]—*Ann. Med. Rep. for the Year ending 31st December, 1925. Tanganyika Territory.* pp. 118–125.

The following items may be noticed. The prevalent malaria parasite is *P. falciparum*; the parasite-rate in children and adolescents appears to be fairly high all the year round. In 967 routine examinations of native faeces ankylostomes were found in 355 cases, and eggs of *Schistosoma mansoni* in 12. Urinary schistosomiasis is common, the incidence in school children in certain places being over 30 per cent. of those examined; in 72 routine examinations of native urines eggs of *S. haematobium* were observed in 30 cases. Search for the molluscan host of this species has not yet been successful, but *Isidora nasuta* has been observed in several places, and in it (in one locality) fork-tail cercariae devoid of "eye-spots." The microfilariae of both *F. bancrofti* and *F. perstans* are prevalent—especially near the big lakes; those of *bancrofti*, though in some cases abundant in the day time, have yet a well-marked periodicity. In routine examinations of 149 native sputa the tubercle bacillus occurred in 49 instances. Dead rats to the number of 22,768 were examined for plague—all in the negative. During the year 261,050 doses of calf-lymph were issued.

A. Alcock.

NIGERIA. **Annual Report of the Medical Research Institute, 1926.** [CONNAL (Andrew), Director.]—*Ann. Med. & San. Rep. Nigeria.* 1926. Appendix A. pp. 89–90.

The following items are taken verbatim from this admirably concise report :—

"The following subjects received particular attention:—Rat plague, yellow fever, prickly heat, tropical ulcer and markings on *Aedes argenteus*.

"Plague in rats was found to be still in an acute form, no evidence of chronicity having been obtained.

"There were further indications that yellow fever in West Africa is not identical with that disease in the Western Hemisphere.

"The cause of prickly heat is considered to be a fungus belonging to the genus Monilia.

"The main factor in the production of tropical ulcer is thought to be *Bacillus pyocyaneus*, of which organism a number of strains have been isolated.

"The markings of *Aëdes argenteus* have been proved to be very variable and no reasons for the creation of new varieties have arisen.

"Other subjects dealt with are blackwater fever, malignant disease, black tongue, leprosy and mosquito-dissections.

"Those who suffered from blackwater fever have invariably shown a malarial history.

"Malignant disease has been shown to be by no means uncommon and the various forms of cancer to be not rare.

"'Black tongue' was investigated and found to be due to a fungus of the oidium type, occurring in cases of relapsing fever.

"Moogrol in the treatment of both early and late cases of the three forms of leprosy, continued to be of great use."

A. A.

NIGERIA. **Annual Report on the African Hospital Laboratory, Lagos, 1926.** [BUTLER (G. G.), Pathologist.]—*Ann. Med. & San. Rep. Nigeria*, 1926. Appendix B. pp. 147–175.

This report contains a wealth of classified detail which will be appreciated by pathologists. A large number of autopsies (256) have been studied with discrimination, and the results are set forth in twenty pages. Here are to be found interesting details of the observed weights of the viscera of Africa natives at different periods of life—a subject of novel attention. Causes of death are analysed at considerable length ; post-mortem observations of 9 cases of malignant disease in natives are fully considered, as also of 5 cases of carbon-tetrachloride poisoning ; and special attention is paid to 4 cases of Bilharzia infection with portal pyaemia and abscesses in kidney and spleen.

In the laboratory 3,874 blood-films, 1,081 specimens of faeces, 385 specimens of urine, and 447 specimens of sputa have been examined. Of 1,049 films of malaria-infected blood 89·5 per cent. were subtertian, 9·3 per cent. quartan, and only 1 per cent. tertian. Microfilaria were found in 3 per cent. of blood-films.

Of the 1,081 specimens of faeces 585 were native and 496 European. Among natives Ascaris was found in 59·2 per cent., Ancylostoma in 25·4 per cent., tapeworm in 7 cases, Schistosoma in 11 cases, and *Entamoeba histolytica* in 8·5 per cent. In Europeans 4·4 per cent. of specimens were infested with *E. histolytica* ; and equally in both races the stools in the majority of these cases were merely loose with admixture of mucus.

Evidence of schistosomiasis was found in 15 per cent. of urines, and tubercle bacilli were present in 13·6 per cent. of 402 specimens of native sputa.

A. A.

UGANDA PROTECTORATE. **Annual Report of the Bacteriological Department for the Year ended 31st December, 1926.** [MARTIN (M.), Acting Director of Laboratory.]—12 pp. 1927. Entebbe : Govt. Printer. [Shs. 2.]

In the absence of Dr. H. L. DUKE, seconded to serve as the President of the International Sleeping Sickness Commission, the Bacteriological Laboratory has been directed by the Senior Assistant. The following items from the Report may be noted.

Schistosomiasis.—In an attempt to estimate the incidence of this infection stools were collected from the gaol and local hospitals and schools. In 640 such examined, eggs of *S. mansoni* were found in 6 cases and of *S. haematobium* in a single case.

Ankylostomiasis.—In a survey of this infection samples of faeces of 571 individuals from the same sources were examined, of which 75 per cent. were found with evidences of infection. In some cases the worms even when numerous were observed to be not causing much inconvenience to the host.

Pneumonia in white rats.—A heavy mortality among these useful animals was found to be due to acute broncho-pneumonia. The organisms isolated were a pneumococcus and a bacillus resembling *B. influenzae* in all respects, except that it was easily grown on ordinary media.

The report refers more than once to difficulties in maintaining constancy of culture-conditions and in preserving certain necessary ingredients of culture-media in Uganda, the causes of which are under investigation.

A. A.

SERGENT (Edmond). Rapport sur le fonctionnement de l'Institut Pasteur d'Algérie en 1926. [**Report of the Pasteur Institute of Algeria, 1926.**]—*Arch. Inst. Pasteur d'Algérie.* 1927. Mar. Vol. 5. No. 1. pp. 55–90. [54 refs.]

The first half of this report is a summary of special research in the laboratory and the field. Experimental observations pursued during a term of three years on a local group of natives have demonstrated the efficacy of cinchonine and cinchonidine in small daily doses (0·2 to 0·4 gm.) upon malaria parasites and also on the enlarged spleen; and the regular administration of quinine as a prophylactic to the railway staff of malarious stations during a similar term has reduced the percentage of cases of malarial fever among the staff from 23·9 to 7·8—the epidemic incidence of malaria in Algiers generally has been little changed during the three years. Experimental usage of stovarsol in a particular district has kept down parasites in children, but only parasites of benign tertian; moreover, stovarsol, is too poisonous for use except in experienced hands. A case of natural infection of *Phlebotomus papatasii* with *Leishmania tropica* has been observed in Biskra; and statistics show the seasonal concurrence of oriental sore with the prevalence of the Phlebotomus. There has been a recrudescence of undulant fever in Oran, where 3·2 per cent. of the apparently healthy goats examined were found to harbour the micro-organism; several experiments justify the conclusion that sheep are immune to this infection. Experiments have shown that theileriasis of North Africa is an entirely different disease from theileriasis of South Africa (coast fever). The observation that a single intradermic injection of the second anthrax-vaccine imparts immediate immunity to local sheep and bovines has been confirmed. A very contagious anaemia of sheep, caused by a filterable virus, and unnoticed before 1924, appears to be analogous to pernicious anaemia of the horse. A sort of commensalism has been discovered between the barm of vinous fermentation and the Drosophila fly that spreads it; the adult fly disseminates the barm in its dejecta, and the larva of the fly is nourished in the fermenting must. The barm as spread by the fly, besides fermenting the must, also protects the ripe grape from mould. A statistical study shows *Taenia echinococcus* to be common only in certain parts of Algeria. A new blastomycosis of man, caused by *Cryptococcus montpellieri*, has been discovered. This part of the report concludes with some sensible remarks upon the hygiene of tropical countries, and upon acclimatization, the author emphasizing the view that since the term "acclimatization" includes two distinct concepts—namely, tolerance of a physical medium and control of a pathological environment—it is useless for any scientific discussion.

The second half of the report deals with administrative and other routine. Here we notice that of 1,530 persons who attended the anti-rabic department, 1,494 underwent the complete treatment, the

mortality being 1·3 per cent. ; and that antimalaria measures of some kind—antimosquito operations of different sorts and regular quininization—were carried out in 56 localities.

A. A.

BOMBAY. **Report of the Haffkine Institute for the Year 1925.** [MORISON, J., Offg. Director.]—32 pp. With 1 chart. 1926. Bombay : Govt. Central Press. [As. 15 or 1s. 7d.]

" Haffkine Institute " is the distinctive appellation that has now been honourably awarded to the Bombay Bacteriological Laboratory by the Presidency Government.

The report for the year 1925 states that Haffkine's antiplague vaccine is becoming popular—a striking reversal of Indian sentiment. No less than 642,370 rats were sent by the Bombay Municipality for examination for plague, and the results with their relation to plague in the city are tabulated. Experiments for improving the antiplague vaccine have been continued. In the course of experimentation it was realized that the standardization of all brews by testing them first on rats was " a notable advance " ; also that although the vaccine is at its best within six months of manufacture, it is hardly less efficient during the following six months and is still potent for a further six months. Controlled experiments with 282 rats and 60 rabbits led to the conclusion that mercurochrome treatment had no influence on the course of plague. In discussing the transmission of plague by *Xenopsylla cheopis* and *astia* the difficulties of carrying out accurate experiments are described —difficulties in identification of the live flea ; in completely ridding a rat of fleas without apparent injury to the rat ; and in variously operative seasonal conditions.

The antirabic section, in this its fourth year, has continued to expand, 4,381 persons having received treatment from the Institute. Of 625 persons treated in Bombay city 0·96 per cent. were classed as failures, and of 3,756 treated at out-stations 0·48 are so estimated. Of 122 Bombay dog-brains examined, Negri bodies were present in 79 ; of 92 dog-brains from out-stations 67 were proved to be rabid.

The study of the pathology of the *Schistosoma spindalis* found in goats and cattle in India was continued by Dr. FAIRLEY, who considers the species to be closely allied, from the pathological standpoint, to *S. mansoni* and *japonicum*. A hookworm survey of 1,937 prisoners of Umarkhadi jail shows a maximum of infection in the rainy month of August and a minimum in the dry month of April.

In the biochemical section, which now is fully equipped, the subjects of special investigation were sprue and the chemical aspects of the growth of plague in broth media.

In the report on indigenous drugs it is stated on the authority of Dr. MHASKAR that *Nyctanthes arbor-tristis* in doses of 20–60 grains of leaf brought " down the temperature to normal in all of 19 cases of malaria."

Dr. Margaret BALFOUR in her studies of the subject has found that an important cause of maternal mortality, in Bombay, is a severe anaemia coming on during the last five months of pregnancy.

Miss MEHTA'S survey of the natural agglutinations of the blood in Parsis included 1,000 individuals believed to be pure-bred in descent from the original Persian emigrants of the seventh century. The

following is the result of the survey stated in Janski terms :—Group I, 37·9 ; Group II, 20·0 ; Group III, 35·7 ; Group IV, 6·4. The ratio of agglutination-factors A/B (racial index) is 0·63.

Miss Mehta has made a further interesting observation. Among the Parsis the priests form a community the members of which until the last thirty or forty years did not intermarry with members of the lay community. In three such unrelated families the heads . . . on both the father's and the mother's side and all their immediate progeny belong to Group I. Any descendants in the 3th and 4th generations that do not belong to Group I, in so far as Dr. Mehta's investigation has gone, are the result of an intermarriage with a member of the lay community."

A. A.

BOMBAY. **Report of the Haffkine Institute for the Year 1926.** [MACKIE (F. P.), Director.]—25 pp. With 2 charts. 1927. Bombay : Govt. Central Press. [Ann. 8 or 10d.]

Of plague-prophylactic 2½ million doses were issued during the year, the blunt monster with the uncounted heads having completely reversed its appetite, and being now disposed to clamour if the supply runs short and to murmur if inoculation be not followed by a smart reaction. All brews are stringently tested for toxicity and for efficiency, before issue, since the immunizing power is so variable. Experiments seem to indicate that a culture of plague bacillus on casein-broth yields a vaccine of higher potency. In an investigation of the pesticidal power of the common phenols and some of their derivatives (116 drugs in all) it was found that their effects *in vivo* did not always correspond with their test-tube value. Experiments for the isolation of a bacteriophage *apud* d'Herelle from infected rats did not yield a potent bacteriophage ; and a deputation sent to study the therapeutic value of d'Herelle's pestiphage in plague-patients at Hyderabad (Deccan) and Agra did not observe any influence on the course or mortality of the disease either by its intravenous or intrabubonic injection, or by both methods combined. Professor D'HERELLE who instituted some operations in the laboratory has been officially invited to return and resume his work on the bacteriophage treatment of plague, cholera, and dysentery.

Of applicants for antirabic treatment 648 underwent the full course at the Institute, of whom 1 died within 15 days and 4 more died more than 15 days after completion of treatment. Means of treatment for many hundreds of other patients were sent out to many places in other parts of India. Much stress is now laid by Assistant Surgeon LE FRENAIS on preliminary cleansing of the bite, even wounds that previously have been cauterized being laid open and treated afresh, to their depths. Of 103 dog-brains examined from Bombay and its vicinity, 84 disclosed Negri bodies.

Various indigenous drugs were investigated in the pharmacology department. The completion of the study of *Holarrhena antidysenterica* shows the plant (entire seed or bark) to compare favourably in antidysenteric value with " any of the medicines now in vogue," and to be a safe, cheap, reliable, and facile remedy for diarrhoea. The seeds of *Wrightia tinctoria* act on diarrhoea like those of *H. antidysenterica*, but the bark is much inferior. The bark of *Alstonia scholaris* is but slightly inferior to that of *H. antidysenterica* in the treatment of dysentery. Of 55 patients with diarrhoea or dysentery treated with powdered rind

of mangosteen fruit (*Garcinia mangostana*) 36 were benefited. In two of 6 cases of glycosuria the powdered leaves of *Gymnema sylvestre* appeared to be effective.

In the biochemistry department attention has been directed to controlling and improving the broth used in the manufacture of plague prophylactic, and to sprue.

The Report contains much information, from Dr. Margaret BALFOUR, about the inquest on maternal mortality and the anaemias which—affecting all the communal elements of the population—constitute one of the most dangerous complications of pregnancy in Bombay. Two classes of cases are recognized: in the one the symptoms are mainly fever and anaemia and the maternal mortality is 14 per cent. of investigated cases; in the other diarrhoea is an additional symptom, and the maternal mortality is 43 per cent.; the infant mortality in the whole run of cases is 53 per cent. The blood picture is that of a primary anaemia with high colour-index and frequency of nucleated red-cells. In 115 bloods examined malaria parasites (mostly malignant tertian) were found only in 12; in 30 Kahn's precipitin tests for syphilis 15 were positive and 15 negative; of 107 urines examined bacterially only 24 were sterile—as compared with 78 per cent. of sterile urines in normal pregnancies; in 17 faeces examinations only one disclosed hookworm. Many of the patients were well to do, able to afford good food, and living under fair hygiene conditions.

A. A.

MADRAS. **Report on the Working of the King Institute of Preventive Medicine, Guindy for the Year 1924-25. With Appendices.** [TURKHUD (D. A.), Acting Director.]—pp. 38+2. 1926. With 4 figs. Madras: Supt., Govt. Press. [1 rupee.]

In the bacteriological section much cholera, influenza, T.A.B., gonococcus and staphylococcus vaccine was produced, and some thousands of autogenous vaccines were prepared. The work of the investigation units of the Institute included three malaria surveys and two inquiries into the prevalence of kala azar. In one of the latter inquiries the existence was demonstrated of a hitherto undetected focus of kala azar at Kayalpatnam, a small seaport of some 13,000 inhabitants, in the Tinnevelly district. The infection was limited to Mohammedans, although these live in close proximity to Hindus, and it appeared to have been introduced in 1884 by Mohammedans from Madras and Calcutta. In view of this discovery, further investigations were made in the Tinnevelly and Ramnad districts and the disease was found to be endemic in 13 villages on the coast, the incidence among Mohammedans being 6·1 per mille, while among non-Mohammedans the incidence was 2·5 per mille. An entomological survey of the infected area was undertaken, and cimex, culicoides, phlebotomus, pulex, conorhinus and a tick (*Ornithodorus savignyi*) were collected in infected houses. *Phlebotomus argentipes* was found in all places visited in the Ramnad district, especially in houses of Mohammedans, 75 per cent. of which harboured these insects. Dissection showed that only phlebotomus and cimex appeared to harbour suspicious flagellate-like bodies, but the feeding of such animals on kala azar patients gave negative results as did the injection of crushed bodies of phlebotomus, cimex and pulex into a puppy and a monkey. Other experimental work had reference to

trachoma in monkeys and rabbits, to the differentiation of lactose fermenters in water, soil and other situations and to the testing of disinfectants for their carbolic co-efficients.

E. Wilkinson.

FEDERATED MALAY STATES. **Annual Report of the Institute for Medical Research, Kuala Lumpur, for the Year 1926.** [FLETCHER (William), Director.]—61 pp. Kuala Lumpur.

This report is full of interesting things, very readably presented, and conveniently printed.

Some careful if not very plentiful (46) trials of plasmochin are fully described. The pith of them is that plasmochin is as powerful as quinine in its action upon benign tertian and quartan parasites, and also is mortal to the crescents, but not to the trophozoites, of subtertian. No toxic symptoms or sequelae were observed in its use.

Four cases of tsutsugamushi disease have been under observation, apparently the first instances of this infection being contracted in the Malay States. A full account of these cases, one of which was fatal, is promised for the *Bulletin* of the institution for 1927.

Sixty-six cases of tropical typhus were diagnosed, and the opportunity of comparing this with tsutsugamushi disease has resulted in the conclusion that although the two have many points in common, they are quite distinct. Characteristic of tropical typhus is the strongly positive Weil Felix reaction ; of tsutsugamushi disease (usually), the primary sore and bubo.

A new observation regarding the fatal disease Melioidosis (see this *Bulletin*, Vol. 22, pp. 659–662) is the finding of the bacillus (*B. whitmori*) in a superficial ulcer in man—the ulcer being evidently the point of inoculation. The bacillus—which already is known to have occurred naturally in rat, rabbit, guineapig, cat, and horse—has this year been found in a dog dead of distemper. The disease has now been discovered to exist in Indo-China.

Leptospira investigation has disclosed the existence in the Malay peninsula of infectious jaundice, seven-day fever, and autumn fever, in addition to another undetermined group ; and has failed to distinguish, by serological means, the leptospiras of infectious jaundice from Noguchi's *Leptospira icteroides*.

In epidemics of measles convalescent serum has been used as a prophylactic with considerable success in control and also in mollifying the clinical course of the disease.

A sample of bacteriophage (received from Dr. D'HERELLE) " employed in the treatment of 22 cases of bacillary dysentery due to organisms of the Flexner group had no apparent influence either upon the course of the disease or upon the infecting bacilli."

A full report on diphtheria is promised. Meantime the results of 2½ years' investigation have led to the conclusions that, although the disease was almost unknown in the F.M.S. before the war, it has been endemic there for many years ; " carriers are common ; the population is highly immune," though " there is no evidence that the local strains of *B. diphtheriae* are less virulent than those isolated in other countries."

From a long and interesting account of enteric fevers only a few outstanding particulars can be selected. The statement that these fevers are uncommon in the F.M.S. is justified ; epidemics are unknown, and in 6 years before 1926 typhoid ulcers had been found only

3 times in the course of 2,000 post-mortem examinations and only 3 carriers had been detected in the course of bacteriological examinations of 4,045 specimens of faex. Critical bacteriological and serological investigations during 1925–1926 resulted in positive diagnosis of 182 cases of typhoid, 9 of paratyphoid A, and 5 of paratyphoid B. It is noteworthy that the majority of the cases came from the smaller agricultural centres. The distribution by race was Tamils 83, Chinese 66, Malays 25, Europeans 10, Punjabis 6, Eurasians 4, others 2. The case mortality was about the same as in other countries ; not more than 13 per cent. were fatal, " and this in spite of the fact that nursing, as nursing is understood in Europe, is hardly practicable in the wards of a native hospital."

In the department for the prophylactic treatment of rabies 142 patients underwent the full course ; 29 had been bitten by animals attested in the laboratory as rabid, and 34 had abrasions probably contaminated with the saliva of such animals ; none developed rabies. The full course consists of 14 daily injections of 5 cc. of a carbolized vaccine containing 1 per cent. of nervous tissue in 0·5 per cent. carbolic saline. A prophylactic vaccine is prepared for dogs and consists of 28 parts of nervous tissue, 48 parts of glycerine, and 32 parts of a 1·25 per cent. solution of phenol in saline, the treatment consisting of a single injection of 6 cc. ; approximately 400 dogs received protective inoculation. Negri bodies were found in 48 of 94 dog-brains submitted for diagnosis.

Of 96 tumours in non-European races 21 were benign and 75 malignant ; of the latter 53 were Chinese, 18 Tamil, and 4 Malay.

By the Malaria Bureau mosquito surveys of rice-fields were carried on, the value of rubber-oil was tested, and attempts were made to infect *Anopheles separatus* with benign, subtertian, and quartan parasites, but were in all cases void .

Among the items in the report of the chemical laboratory there is a description of a new method of preparing a vitamin B extract that has been pronounced to be highly efficient in the treatment of beriberi.

A. A.

Geneeskundig Tijdschrift voor Nederlandsch-Indië. 1927. Vol. 67. No. 4. pp. 553–573. [1 ref.] Jaarverslag van de Landskoepokinrichrichting en het Instituut Pasteur te Bandoeng over het jaar 1926. [**Annual Report of the Government Vaccine Institute and Pasteur Institute at Bandoeng for 1926.**]

The number of vaccinations performed during 1926 was 1,347,321 with 95·8 per cent. success. Experiments with Otten's dried vaccine continued to furnish satisfactory results. This vaccine is prepared by drying pulp in a vacuum over sulphuric acid for 24 hours, reducing the dried product to powder and distributing into vacuumized tubes, which are sealed. The virulence of this vaccine was maintained for months at temperatures which destroyed the glycerinated vaccine in a few days, provided the sealing of the container was complete.

Of 936 persons who presented themselves for advice as regards antirabic treatment 683 underwent the treatment. Numerous detailed tables are given of the points which are required in the statistical analysis of the success of that treatment. Diagnostic work undertaken at the Institute ranged over the usual items of a pathological laboratory.

Vaccines and sera are distributed, such as, mixed cholera typhoid vaccine 334,342 cc.; mixed dysentery vaccine rendered atoxic by treatment with formol 69,208 cc.; old tuberculin 1,465 cc.; tetanus, dysentery and diphtheria sera, etc.

W. F. Harvey.

Geneeskundig Tijdschrift voor Nederlandsch-Indië. 1927. Vol. 67. No. 3. pp. 339–346. Jaarverslag van het Militair Geneeskundig Laboratorium over het jaar 1926. [**Annual Report of the Military Medical Laboratory [Weltevreden, Java] for 1926.**]

This annual report shows the activity of the military medical laboratory under its director Lt.-Col. S. L. Brug. Primarily, this activity is practical: Examination of bacteriological, protozoological, pathological or entomological material sent by the medical officers; but scientific investigations are also carried out. Among the results mentioned in this report may be cited the data concerning 2,500 examinations of the stools of 1,213 individuals. *Entamoeba histolytica* was found in 12·3 per cent., *E. coli* in 10·2 per cent., *E. tenuis* in 1·2 per cent., *Endolimax nana* in 7·3 per cent., *E. williamsi* in 7·3 per cent., *Lamblia intestinalis* in 12·7 per cent., *Trichomonas intestinalis* in 2·4 per cent., *Chilomastix mesnili* in 1·1 per cent.; *Balantidium coli* and *Dientamoeba fragilis* were found once.

N. H. Swellengrebel.

Transactions of the Royal Society of Tropical Medicine and Hygiene. 1927. July 11. Vol. 21. No. 1. pp. 1–17. With 5 figs. on 1 plate.—**Laboratory Meeting, 17th March, 1927.**

The demonstrations and orations at this fascinating meeting included (1) Sections of cutaneous leishmania lesions from infection carried experimentally from man to man by *Phlebotomus papatasii*; preparations illustrating the distribution and behaviour of *L. tropica* in *P. papatasii*, and preparations illustrating diagnostic features of *P. minutus, africanus,* and *shortii*; all by Dr. S. Adler. (2) Smears showing schizogony of *Plasmodium falciparum* in peripheral blood, a phenomenon frequently observed in cases of no great severity among the British forces in Macedonia, in 1917; by Major J. S. K. Boyd. (3) Specimens illustrating experimentally-produced immunity against infestation by the tumbu-fly (Cordylobia) maggot; Drs. Blacklock & Gordon. (4) Illustrations of oriental sore of the Khurdistan bear, observed by Mr. C. Machattie & Major J. R. Chadwick. (5) Bresslau's method of exhibiting details of ciliary investment of Infusoria; thus described by Mr. C. A. Hoare:—

"A mixture of 'Phloxinrhodamin' (6·5 per cent. solution) and 'Opalblau' (10 per cent. solution), in the proportion of four to six drops of the former to 1 c.cm. of the latter, is used. A drop of fluid containing the ciliates is placed on a slide and a small drop of the mixture is added to it. The two are carefully mixed and spread over the slide in a thin film. The slide is then dried in the air and may be left unmounted, or mounted in Canada Balsam. The solution fixes and stains simultaneously; the stain being deposited in all the depressions and around all the appendages."

(6) Specimens of massive gangrene and perforation of large intestine and microscope sections of liver illustrating remarkable aggregations of entamoeba, all from a case admitted to hospital with a provisional diagnosis of typhoid. Neither enlargement nor tenderness of liver was evident during life, although one of multiple liver abscesses had burst into the peritoneal cavity; case explained by Dr. P. H. MANSON-BAHR. (7) Smears and cultures from a case of anthrax in an elephant; sections of the animal's liver and lung contra-indicated infection through gut or respiration; all by Dr. H. H. SCOTT. (8) Diagnostics of some Indian species of Phlebotomus; by Major J. A. SINTON, V.C. (9) Fungous aetiology of prickly heat; by Dr. E. C. SMITH. (10) Sections illustrating similarity in type of spleen lesions in yellow fever, typhus, and Rocky Mountain fever; by Dr. A. C. STEVENSON. (11) Films of human faeces illustrating multiple Protozoa infection; also twenty-years-old Giemsa-stained films mounted in Canada balsam, showing retention of stain at edge of cover-glass and fading at centre, and *vice versâ* in the case of pigment of malaria parasites; by Dr. C. M. WENYON, F.R.S. (12) By Drs. W. YORKE & A. R. D. ADAMS, preparations showing remarkable concentration of *Entamoeba histolytica* cysts by the method described in *Ann. Trop. Med. & Parasitol.*, 1926, p. 281; also showing the fresh-excysted *Entamoeba histolytica* with its four massed nuclei, it being explained that usually this 4-nucleate creature splits, either directly or indirectly, into four uninucleate individuals; also were shown sections of amoebic ulceration in stomach and colon of a rabbit fed with a concentrated suspension of washed *E. histolytica* cysts, and, furthermore, a large subcutaneous amoebic abscess in a guineapig, produced by injection of a similar suspension.

Dr. Tadasu SAIKI described the results of his and Dr. FUJIMAKI'S great and manifold experiments in the production of urinary and biliary calculi in white rats (and some mice and dogs) fed on sophisticated diets and also in the production of cancer by the same experimental methods. The details cannot be quoted in full here; but, to be brief, in the animals fed on a particular "vitamin A-deficiency diet" stones in bladder, kidney, and bile-duct began to form at definite terms, the stones in the bile-duct consisting mainly of cholesterol and pigment, the other stones mainly of bone-earth, triple phosphate, and a trace of Na and K. The same results were observed in rats fed on diet deficient both in vitamin A and in vitamin C. The same results also in rats fed on diet deficient both in vitamin A and in Ca and P., except that the bile-duct stones contained abundant Ca salts besides the cholesterol and pigment. Very similar results also in rats fed on diet deficient both in vitamin A and in protein, except that kidney stones were not observed, and that the bladder stones consisted mainly of bone-earth and a protein-like substance. Furthermore, in some selected rats, that had calculi, these disappeared after more than three months of a diet rich in vitamin A. In rats fed on "vitamin B deficiency diet," or on "vitamin C-free diet," or on both these diets together, or on protein-deficiency diet—as in the normally-fed controls of these experiments—no calculi were found.

In the cancer experiments "papillomatous or carcinomatous epithelial proliferations developed in the fore-stomachs of the rats fed on a vitamin A-deficient diet."

Dr. Tadasu SAIKI described his studies of some unhulled rice 144 years old. Compared with new unpolished rice the only remarkable difference in this old rice was a diminution of the fat constituent. The

catalytic activity also of the old rice was very weak, and since HIGUCHI and FUJIMAKI have found that in rice the activity of the catalase and the vitamin B content are parallel, it is to be inferred that the vitamin B content of old rice is very doubtful.

Sir Andrew Aguecheek lamented that his favourite dish did harm to his wit, and Petruchio made some trenchant remarks upon the physiological effects of his rascal cook's bill of fare ; and now we have here Dr. Tadasu Saiki complaining loudly of the menu provided by the cook who " lacks the knowledge of physiology and food chemistry " and boldly teaching " the perfection of the art and mode of cooking." His object is " to meet the nutritive requirements in each meal," not merely for a given day or year. His " wishes and hopes are so to develop the menu as to make it constitute perfect nutrition in one meal or even in one dish." The prefect of the kitchen, in short, must be an Archimagirus.

A. A.

CHOLERA.

LARA (Hilario) **Interesting Features of a Rural Outbreak of Cholera due to Infected Drinking Water.**—*Amer. Jl. Hyg.* 1927. Sept. Vol. 7. No. 5. pp. 606–613. With 2 text figs. & 1 graph. [Coll. of Med., Univ. Philippines, Manila.]

During the month of March, 1926, a small outbreak of cholera occurred in Capaclan and in the Poblacion on the island of Romblon, in the Philippines. The total number of cases was 25, occurring within a period of eleven days, 16 in Capaclan and 9 in the Poblacion. Twenty-three died. Twenty-four of the cases gave a history of previous inoculation with anti-cholera vaccine, 23 less than 4 months previously; 18 received only one dose. It may be questioned whether the right dose was always given. The inoculations are frequently administered by locally trained sanitary inspectors whose technique at times may be open to criticism. Of the two cases which recovered one was a boy of 12 who had never been inoculated. The cases were due to infection of a spring used for drinking. This spring was subject to surface contamination and cases of cholera had occurred in the locality about 3 months previously. Bacteriological examination of springs Nos. 1, 2 and 4 were positive for *V. cholerae*. Only No. 2 was ordinarily used for drinking purposes. The contamination of Nos. 1 and 4 was probably due to the washing of the clothes of cholera patients in them.

J. H. Tull Walsh.

PALMER (F. J.). **Sporadic Cholera in Cachar and its Association with a Hitherto Undescribed Type of Organism.**—*Jl. Trop. Med. & Hyg.* 1927. Oct. 1. Vol. 30. No. 19. pp. 248–254.

The author considers that our knowledge of clinical cholera is still in a fluid condition and states that experience has shown him that the textbook teachings are, in some respects, inaccurate. During the cholera season of 1925 he began to closely study films made from the stools of cholera cases. From an intensive study of films from over 60 cases there is no evidence that the comma bacillus plays any part in causing sporadic cholera in Cachar, in ordinary years. On the evidence of films, cholera in Cachar, in the absence of widespread epidemics, appears to be associated with a small cocco-bacillus, which often assumes a bi-polar staining form; also a spore-bearing bacillus was seen. Clinical cholera in Cachar has in some cases been found associated with infection presumably due to pig's faeces. The author admits that these observations are, for many reasons, imperfect.

J. H. T. W.

i. BRAHMACHARI (B. B.). **On the Prevalence of *Vibrio cholerae* in Some of the Endemic Areas of Bengal.**—*Indian Jl. Med. Res.* 1927. Oct. Vol. 15. No. 2. pp. 361–371. [15 refs.]

ii. ——. **Can the Non-Agglutinating Vibrios be Mutation Forms of the Cholera Vibrio?**—*Indian Med. Gaz.* 1927. Nov. Vol. 62. No. 11 pp. 630–633. [5 refs.]

i. This is a report of the Officiating Director of the Bengal Health Laboratory. With a view to finding out the distribution of cholera

carriers the author examined, from November 1926 to May 1927, the stools of 3,598 persons in villages of Central Bengal and 2,176 stools of persons in North Bengal. Later, June to December, stools of 1,377 villagers living near Calcutta were examined, and healthy persons from whom agglutinating vibrios were obtained were two contacts and three persons having no connexion with the disease, the total rate being 0·4 per cent. The number of persons carrying non-agglutinating vibrios was 13·7 per cent. In cases examined month by month from June to November no agglutinating vibrios were found ; but in November and December they were present in one-third of the cases. To elucidate the relation of non-agglutinating vibrios to the typical *V. cholerae* the author was studying 69 such strains including 19 from water.

ii. In this paper the author gives details of the investigations mentioned above. He finds that vibrios which do not agglutinate with the standard cholera immune serum are more common than the agglutinating type and concludes that the non-agglutinating vibrios are but the agglutinating types transformed by the environment through which they have passed or in which they are sojourning. [All bacteria are liable to variation and non-agglutinating strains are well-known in other groups. Compare for instance *Enterica*—this *Bulletin*, Vol. 16, pp. 449–450 (Garrow, and other references).]

J. H. T. W.

Mastroianni (A.). Dimostrazione rapida del vibrione del colera con un nuovo apparecchio per siero-diagnosi. [**Rapid Demonstration of *V. cholerae* by a Method of Serum Diagnosis.**]—*Riforma Med.* 1927. Sept. 5. Vol. 43. No. 36. pp. 847–848. With 1 text fig.

The " new apparatus " described by the author consists of two test tubes, the larger measuring 20 cm. in height and 2·5 cm. in diameter, the small one 10 cm. and 1 cm. in diameter. Each has a small cross tube near the top. The large tube is filled to the cross tube with peptone water and inoculated with the suspected faecal matter, it is then incubated for 5 or 6 hours. The smaller tube containing the antiserum is then joined to the large one by the cross tubes. By tilting the large tube a minute quantity of the culture can be passed into the serum tube and agglutination observed. The tubes can easily be separated for cleaning and sterilization.

J. H. T. W.

Brahmachari (B. B.). **Forecasting of Epidemic Activity of Cholera.**—*Calcutta Med. Jl.* 1927. May. Vol. 21. No. 11. pp. 525–535. With 6 text figs.

The author believes that if we could predict outbreaks of cholera much mental and economic strain would be saved. The problem has indeed aroused attention [*v.* this *Bulletin*, Vol. 22, p. 765 (Russell, Rogers, King) ; Vol. 24, p. 41 (Rogers)]. The author, as the result of his studies, has produced the seasonal curve of cholera in Bengal. As regards cyclical periodicity he gives a chart of mortality in Bengal from 1891 to 1924 from which it will be seen that " in 27 out of these 34 years, the figures of the cholera mortality were more or less on the

graph of a cycle, their deviations from the centre of gravity being obviously a harmonic function of time, the equation being :—

$$Y = a \sin nX$$

With the norms for the months calculated ready to hand prediction of the disease for the next succeeding months is not so difficult.

J. H. T. W.

ARNOLD (Lloyd). **The Auto-Sterilizing Mechanism of the Gastro-Intestinal Tract. (A Note on the Use of Dilute Acids in the Prevention and Treatment of Cholera).**—*Indian Med. Gaz.* 1927. Aug. Vol. 62. No. 8. pp. 444–448. [18 refs.] [Univ. of Illinois, College of Med., Chicago.]

The author notes the well known inhibitory effect of the gastric acid on certain bacteria and gives tables showing the condition of the intestinal flora in dogs under varying H-ion concentration. Bacteria introduced into an empty stomach of a dog 12 to 18 hours after a meal do not reach the caecum. Bacteria introduced with alkaline buffered milk reach the caecum in large numbers over a relatively long period of time ; when given in acid buffered milk they sometimes reach the caecum but only a few bacteria do so and these soon disappear. Bacteria given by the mouth to a dog in acid buffered aqueous solutions seldom reach the caecum ; but when given in alkaline solutions they do so. The author calls attention to Dr. TOMB'S success in treating cholera with sulphuric acid, essential oils and a little alcohol. Useful references are given at the end of the paper.

J. H. T. W.

WATSON (Malcolm). **The Control of Cholera on Rubber Estates.**—*Malayan Med. Jl.* 1927. Dec. Vol. 2. No. 4. pp. 122–123.

The author asserts that the freedom from cholera of the estates in Selangor, in the past few years, is mainly, if not almost entirely, due to the efficient quarantine system now in force. Fifteen or twenty years ago cholera was frequently seen in the Selangor Coast Districts. Cholera still comes over in steamers year by year ; but has not been seen on any estate in the coast districts since 1911 with the exception of 1918 and 1926. Few managers have had any experience of controlling the disease. When a coolie in the lines is suspected to have cholera, the first thing is to isolate him and the contacts. This should be done by building a hut for him and another for the contacts. It is not desirable to send a cholera case to an ordinary estate hospital. Not more than three persons are placed in a contact hut. The belongings of these coolies are taken from their rooms, piled in a heap and burned. The contacts are stripped, washed in a solution of izal, given 4 yards of calico as a cloth and given new cooking pots. They take nothing from their rooms. If a case develops among any contacts, the hut and its contents are burned. The sick man is taken to the cholera camp, and the other two are disinfected again, and given a new hut and new clothing, etc. They are not to be put with other contacts. Food is brought to the camp and distributed to the huts ; but the contact coolies cook for themselves, to give them some occupation. All water should be boiled. A temporary latrine trench is dug and frequently disinfected during the day. Inoculation of contacts has proved of value, making them immune and limiting the disease.

J. H. T. W.

Fernando (Juan S.). **Inoculation and Hospitalization in the Control of Cholera Epidemic.**—*Jl. Philippine Islands Med. Assoc.* 1927. Oct. Vol. 7. No. 10. pp. 385–393. With 3 charts. [12 refs.]

The author is a Medical Inspector, Philippine Health Service, and gives the results of his observations in a summary :—

1. Inoculation confers a certain degree of immunity which partly influences the duration of the epidemic.

2. Immunity is not absolute; persons inoculated contract the disease.

3. Intensive and systematic inoculation with isolation in hospital of cases, contacts and carriers make a more effective combination.

J. H. T. W.

d'Herelle (F.) & Malone (R. H.). **A Preliminary Report of Work carried out by the Cholera Bacteriophage Enquiry.**—*Indian Med. Gaz.* 1927. Nov. Vol. 62. No. 11. pp. 614–616. [Central Research Inst., Kasauli, India.]

The correlation of the presence of bacteriophage and recovery from cholera is given in the following series of cases : (1) 3 cases with no bacteriophage present, all died ; (2) 3 cases with feeble bacteriophage which disappeared, all died ; (3) 2 cases with strong bacteriophage on admission, recovered promptly ; (4) 13 cases with weak bacteriophage which increased in potency, all recovered with some delay ; (5) 2 cases with fluctuation of potency, recovered with some delay. The conclusion drawn is that recovery or death is intimately associated with the behaviour of the intestinal bacteriophage. The epidemiology of cholera is also explained in terms of bacteriophage. With the occurrence of a first case of cholera in a village vibrios are passed out and find their way into wells or are taken up by flies. When convalescents appear, the bacteriophage, as well as the vibrio, passes out into wells or is taken up by flies. The epidemic comes to an end when the bacteriophage "contamination" becomes general. It is but a further step to apply these facts to prevention and treatment. In one village the epidemic came to an immediate end with the addition of 30 cc. of bacteriophage culture to the two wells supplying it with water. Again, in 4 villages in which treatment of cholera was undertaken the sum total of results was, 68 deaths among 107 cases not treated with bacteriophage and only 3 deaths out of 41 cases among the treated. The further results of this preliminary enquiry will be awaited with interest [it would be especially interesting to have strictly alternate cases only treated with bacteriophage].

W. F. Harvey.

Saïtzewa (E. V.). Sur la nature des vibrions, isolés de l'eau de la Néva pendant l'absence de l'épidémie du choléra. [**Vibrios isolated from the Neva during Absence of Epidemic Cholera.**]—*Arch. Sci. Biol.* 1927. Vol. 27. No. 1–3. French summary p. 206. [In Russian pp. 189–198.] [Epidem. Lab., Inst. of Experim. Med., Leningrad.]

In the months of March and April 1926, when no signs of cholera were present, two strains of a vibrio, identical with *V. cholerae*, were isolated from the water of the Neva at Leningrad. All waters should be examined periodically for vibrios in view of their possible connexion with epidemics.

J. H. T. W.

McDonnell (A. J. V.). **Blood-Pressure Readings as an Aid to the Treatment of Cholera.**—*Jl. Trop. Med. & Hyg.* 1927. Dec. 1. Vol. 30. No. 23. pp. 301–303. With 3 charts.

These investigations were carried out at the Anglo-Persian Oil Company's Hospital, Abadan, during a recent outbreak of cholera with a view to finding a substitute for the blood specific gravity test. In severe cases blood pressure readings on admission were impossible to obtain; but in every case (15 cases investigated) they could be obtained after the first pint of saline infused. Charts are given showing treatment, blood pressure, pulse and respirations. All cholera outfits should

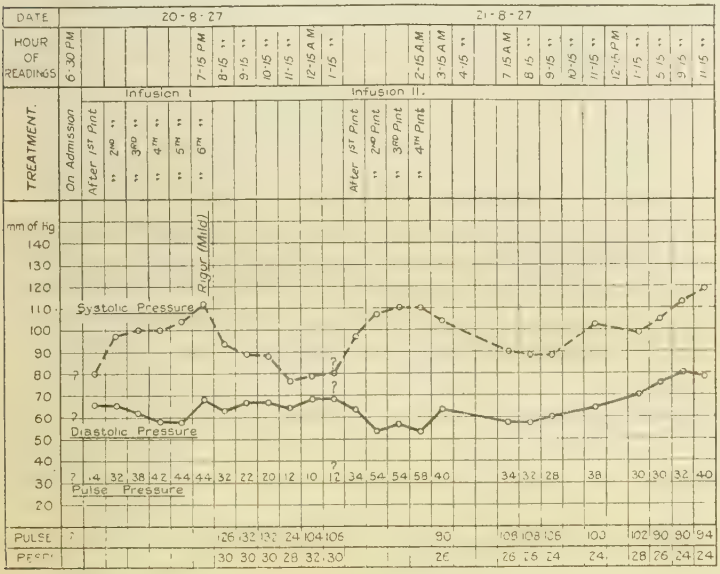

Chart 'A' relating to a strong well-developed Persian male about 35 years old admitted to hospital some six hours after onset of cholera. Typical deviation of systolic and diastolic pressures during infusion is shown. The patient made an uneventful recovery except for minor haemorrhages from gums and into conjunctivae.

[Reproduced from the *Journal of Tropical Medicine and Hygiene.*]

contain a sphygmomanometer. Blood pressure readings should be taken after every pint of saline infused and until the patient is out of danger. From the pulse pressure definite information is obtained when to infuse and when to cease infusing. A pulse pressure of under 20 mm. of mercury indicates the need of further infusion; during infusion an increase of less than 4 mm. pulse pressure over the previous reading implies that infusion should be discontinued. Adrenalin chloride is contra-indicated as it causes a rise in the diastolic pressure.

J. H. T. W.

JETTMAR (H. M.). **Investigations on the Vitality of Vibrio Cholera on Chinese Paper Money.**—*Nat. Med. Jl. China.* 1927. June. Vol. 13. No. 3. pp. 254–260. [14 refs.] [N. Manchurian Plague Prevention Service, Harbin.]

It is well known that cholera vibrios when dried on solid objects die in a comparatively short time. Any degree of moisture may delay their death. It is of practical interest to know how long *V. cholerae* may live on coins and bank notes. UFFELMANN has shown that the vibrios perish quickly on coins and more quickly on copper and silver coins than on gold. It is a question of some importance for North China, with its almost exclusive paper currency, to know for how long the vibrios will live on infected banknotes. From his experiments the author concludes that : The cholera vibrios when dried on banknotes touched by fingers infected with cholera stools remain alive up to 4 hours. *V. cholerae* cultivated from banknotes 4 hours after contamination showed the same cultural and serological qualities as the original strain. Thus, during cholera epidemics the use of banknotes is not entirely free from danger.

J. H. T. W.

LANDSTEINER (K.) & LEVINE (Philip). **On a Specific Substance of the Cholera Vibrio.**—*Jl. Experim. Med.* 1927. Aug. 1. Vol. 46. No. 2. pp. 213–221. [2 refs.]. [Rockefeller Inst. Med. Research, New York].

Whereas extracts with ether or strong alcohol were inactive, that made with 75 per cent. alcohol was specifically active. A flocculent precipitate appeared in the extract on cooling, which when separated and washed with absolute alcohol and dry ether, furnished a grey-white powder. The powder gave the precipitin reaction with cholera immune serum in high dilution and was free of bacilli. It had antigenic capacity and contained both protein and carbohydrate. On further purification a white powder was obtained almost protein-free and devoid of antigenic activity. "When hydrolysed with N-2 hydrochloric acid, sugar could be demonstrated by Fehling's solution and by the osazone test." On testing with cholera immune serum this purified substance gave as high a precipitin reaction as the original cruder product. Thus in the original crude extract there was present an antigenic complex of protein and specific substance. The purified extract, on the other hand, still contained specific substance as shown by its reaction with immune serum, but was protein-free and not by itself antigenic : it would appear either to be of intricate structure or a complex carbohydrate resembling that described by AVERY and HEIDELBERGER.

W. F. Harvey.

HAHN & HIRSCH. Choleratoxin und Antitoxin. [**Cholera Toxin and Antitoxin.**]—*Cent. f. Bakt.* I. Abt. Orig. 1927. Vol. 104. No. 1-4. pp. 211–212.

It is only by the use of comparatively fresh strains that potent toxins have been obtained. Among the most striking results of the authors were : (1) The production of toxin in cultures within 8 hours and maximum production in 3 days ; (2) a further concentration of toxin by dialysis ; (3) the production of heavy growths in a short time,

with maximum at 5 to 6 hours. The last result was only rendered possible by continual rectification of the pH point of the medium to above 7·2, and was obtained by the addition of about 100 cc. N-2 soda per 500 cc. in 12 hours. Two of their strains furnished toxins within 3 days which killed 200–250 gm. guineapigs intraperitoneally in 12–24 hrs., in amounts of $\frac{1}{4}$ to 1 cc. After a 2 months course of treatment of goats with comparatively small doses of toxin they have obtained an antitoxin of which 0·005 cc. neutralized one minimum lethal dose of the toxin. Ten times this dose of antitoxin injected intraperitoneally, one hour after the toxin, could still preserve a guineapig from death. In addition to acting as an antitoxin the serum was both agglutinating and bacteriolytic.

W. F. Harvey.

Popesco-Combiesco (Cornelia). Action préventive vis-à-vis de la péritonite vibrionienne expérimentale de l'extrait de plaquettes sanguines de lapins immunisés contre le vibrion cholérique. [**Protective Action of the Extract of Blood Platelets of the Immune Rabbit against Cholera Vibrio Peritonitis.**]—*C.R. Soc. Biol.* 1927. Oct. 13. Vol. 97. No. 26. pp. 1001–1002. [1 ref.] [Exper. Med. Lab., Faculty of Med., Bucarest.]

This action was shown to exist for the blood platelets themselves (this *Bulletin*, Vol. 24, p. 46). The extract now tested is made with distilled water, freed by centrifugation from corpuscular stroma and made isotonic by the addition of salt. Out of 6 immunized rabbits, 4 furnished extracts which protected and 2 extracts which were in no way protective, although the corresponding sera were highly agglutinative and vibriolytic. The results with the extracts were as follows : 11 guineapigs out of 20 survived as against none out of 7 controls. The same test carried out with an extract of blood platelets of the normal rabbit gave 2 survivors out of seven. Microscopical examination of the peritoneal fluid of guineapigs, reserved for the purpose, showed a rapid transformation of the injected vibrios into granules, as in the usual Pfeiffer phenomenon. There could be no suspicion, however, in these well washed platelets that some residual immune serum remained attached to them. Moreover the same phenomenon was exhibited by extract of normal platelets.

W. F. Harvey.

Engelhardt (Wilhelm Erwin) & Ray (Jyotis Chandra). Zur Frage der oralen Immunisierung gegen Cholera. [**Oral Immunization against Cholera.**]—*Ztschr. f. Hyg. Infektionskr.* 1927. July 25. Vol. 107. No. 3-4. pp. 663–676. [18 refs.] [Hyg. Inst., Univ. Berlin.]

The somewhat contradictory views of various workers and the results of their own re-investigation of the subject are here set out. An endeavour is made to determine ; (1) whether it is possible to produce cholera experimentally in either guineapigs or rabbits, and if so, whether it is possible to immunize *per os* against such orally produced cholera ; (2) whether it is possible to immunize orally against parenterally produced cholera ; (3) what the agglutination reactions are under these circumstances.

The results obtained were : (1) It was only in some cases possible to obtain oral infection in guineapigs which had been sensitized with bile, and then only with very large doses. This method could not therefore be used for testing the value of oral immunization ; (2) It was not possible to effect an immunization orally in guineapigs either with living or dead vibrios against intraperitoneal or intracardiac infection, even if they had been sensitized with bile ; (3) It was not possible to obtain oral infection in healthy rabbits when sensitized with bile. This was possible however in rabbits which had received vibrios orally for immunization purposes and which had received the associated treatment of bile and no food, if large doses of cholera vibrios were used to infect. The resistance of these rabbits had been lowered or they had become more susceptible to infection ; (4) It was possible to immunize sensitized rabbits orally with very large doses of living vibrios, provided they had survived the immunization process ; (5) It was not possible to develop immunity in rabbits with killed vibrios ; (6) A significant increase in the agglutination titre could only be attained in sensitized rabbits which had been treated with killed vibrios ; (7) Bile pastilles produced no harmful symptoms in man ; (8) It is not possible to draw satisfactory conclusions from animal experiment for application to man owing to the variability found to exist among different species of animals.

W. F. Harvey.

League of Nations. Health Organisation. **Cholera Bilivaccine and Anti-Cholera Vaccine : a Comparative Field Test.** [Russell (A. J. H.).]—29 pp. C.H.662. [12 refs.] 1927. Oct. 27. Geneva.

The author gives the data of a controlled test in India of these two vaccines and a comparison of these with each other and with results amongst the untreated. These vaccines were given in hamlets chosen as affording the best opportunities for the work, while the untreated controls were made up of persons in households who refused treatment. Although these two factors introduce elements of selection in the groups of treated and untreated they were not considered such as would greatly influence the result in regard to age and sex distributions. In 72 villages the vaccines were administered side by side and a special analysis of this important part of the trial is given. Here the groups of the treated are directly comparable. A separation is rightly made of the groups of individuals receiving one, two and three doses of vaccine. It is interesting to know that in a certain proportion of cases the bile pills caused a severe, acute diarrhoea. The two doses of anti-cholera vaccine contained 12,000 million cholera bacilli and the three doses of bilivaccine something over 200 billions. Amongst the 1,448 persons receiving two doses of anti-cholera vaccine there was an attack incidence of 0·41 per cent. (6 cases) and percentage mortality of 16·7 (one case). Of 3,085 persons receiving the full course of 3 doses of bilivaccine 15 were attacked (0·49 per cent.) and 4 died (26·7 per cent.). In the group of 7,664 controls 160 were attacked (2·1 per cent.) and 71 died (44·4 per cent.), which gives an attack incidence 4·6 and 5·2 times, respectively, higher than the rates for the two protected groups. The work of vaccination was not done in any village before the onset of the epidemic. In general it was only after some persons had been attacked and a few had died that the vaccination work started. This, too—it is pointed out—introduces an element

of selection. Special reference in the report is made to the facts which help to determine the reliability of the statistics collected. Actual figures of attacks and deaths were obtained from the reports of village munsiffs and these were subsequently verified by the sub-assistant surgeon medical staff concerned in the enquiry. That the data are homogeneous, except as regards vaccination and attack or death, can be shown by independent evidence. The evaluation of numerous correlation coefficients make it possible to conclude that: (1) The case for anti-cholera vaccination is a strong one; (2) the immunity conferred by a single dose of anti-cholera inoculation is nearly as high as that conferred by a full course of oral vaccine; (3) "it may therefore be inferred that, remembering the limitations already mentioned, a high degree of immunity is conferred by the administration of the oral and subcutaneous vaccines, but that the effect of the anti-cholera inoculation is in the long run superior to bilivaccine treatment."

W. F. Harvey.

Marsh (E. B.). **A Lecture on Cholera.**—*China Med. Jl.* 1927. July. Vol. 41. No. 7. pp. 597–605.

This lecture deals only with the pathology and treatment of cholera. It contains nothing new; but, within its limits, is full of concise information on the bearing of pathology on treatment.

J. H. T. W.

Tomb (J. W.). **A Criticism of the General Treatment of Cholera by Intravenous Hypertonic Saline Injections.**—*China Med. Jl.* 1927. Oct. Vol. 41. No. 10. pp. 840–847. [9 refs.] [Asansol Mines Board of Health. Bengal, India.]

The main arguments and most of the details of this paper have been published in another journal; and were noticed in this *Bulletin*, Vol. 24, p. 924 (Tomb).

J. H. T. W.

Banerjee (Sudhindra Nath). Observations on 106 Cases of Cholera (treated in the Carmichael Medical College Hospitals).—*Calcutta Med. Jl.* 1927. Nov. Vol. 22. No. 5. pp. 237–248.

Black (E. H.). An Epidemic of Cholera in the Lower Perak District along the Perak River.—*Malayan Med. Jl.* 1927. Dec. Vol. 2. No. 4. pp. 123–127.

Buddle (R.). A Case of Cholera treated by the Essential Oils Mixture of Tomb. —*Jl. Roy. Nav. Med. Serv.* 1927. Oct. Vol. 13. No. 4. pp. 304–305.

Maxwell (James L.). The History of Cholera in China.—*China Med. Jl.* 1927. July. Vol. 41. No. 7. pp. 595–597.

Quémener (E.). Epidémie de choléra dans l'établissement français de Karikal (juin-juillet-août 1927).—*Bull. Soc. Path. Exot.* 1927. Oct. 12. Vol. 20. No. 8. pp. 708–710.

Thomson. L'épidémie de choléra de l'Irak en 1927.—*Bull. Office Internat. d'Hyg. Publique.* 1927. Nov. Vol. 19. No. 11. pp. 1620–1626. With 1 map.

Tomb (J. W.). The Essential Oils Treatment of Cholera. [Letters, Notes & Answers.]—*Brit. Med. Jl.* 1927. Aug. 20. p. 332.

PLAGUE.

DICKIE (Walter M.). **Plague in California 1900-1925. Plague Pathology and Bacteriology.**—*Proc. Conference of State & Provincial Health Authorities of North America, 1926.* pp. 30–78. With 14 charts & 3 figs. on 2 plates.

Plague, when it first appeared in San Francisco in 1900, did not spread beyond the Chinatown quarter of the city. The infection lasted for four years and 121 cases with 113 deaths were recorded. The second visitation in San Francisco began in May, 1907. The disease spread widely over the whole city, and its extension was probably favoured by the ruinous condition following upon the earthquake and fire from which the city suffered in April, 1906. From May, 1907 to November, 1908 there were 160 cases, almost all among white persons, with 78 deaths. From that date till 1925 there were 18 outbreaks in California; all except two were of the bubonic type; and most of them consisted of less than 5 cases. During the 25 years reviewed in this report there were 372 cases with 257 deaths. A pneumonic-plague outbreak of 14 cases occurred at Oakland in September, 1919; 13 of the patients died. As so often happens even in communities with a skilled medical and public health service the nature of the outbreak was missed for a time, although the cases exhibited a high fatality, and although the circumstances indicated a history of close contact with pre-existing cases. In October, 1924 the second epidemic of the pneumonic type occurred at Los Angeles: there were 32 cases with 30 deaths in the Mexican quarter of the city. The true nature of the early cases in this outbreak was not at first recognized. [In the reviewer's opinion the recognition of pneumonic plague is not difficult provided that the mind is kept open to the possibility of its occurrence—a suspicion is justified wherever rodent plague is known to exist—and provided recourse is had to the simple and extremely useful procedure of examining smears taken by puncture from the apices and bases of the lungs and heart-blood of persons found dead in suspicious circumstances. By this means invaluable knowledge may be gained in a few minutes. Lung puncture as a diagnostic aid during life, should certainly be practised more often than hitherto.] The general features of the two Californian outbreaks of pneumonic plague are so typical that details need not be given, but it is worth noting that the Oakland epidemic was traced definitely to ground-squirrel plague, and that the Los Angeles epidemic was brought about by rat infection; bubonic plague in man formed the intermediate link.

A table giving the distribution of human plague in California from 1900 to 1925 shows the origin of each outbreak. The two outbreaks in San Francisco, referred to above, were of rat origin; the next bubonic outbreak of 16 cases in Alameda County was associated with both rat and squirrel plague; the next fourteen outbreaks, all of them bubonic with the exception of the Oakland epidemic, originated from squirrel infection; and the last three outbreaks, all of them in Los Angeles County or City, arose from rat plague. An important clue to this order of events is the circumstance that ground-squirrels and rats may occupy the same burrows, that the fleas of these rodents readily exchange hosts, and that the fleas of both species may bite man in the absence of their proper hosts; moreover, for many years

squirrels were largely used as an article of food. Dr. Dickie believes that in Los Angeles City and County rat plague preceded and was responsible for plague among the ground-squirrels.

The report gives an account of the quarantine measures taken to limit the pneumonic outbreak in Los Angeles. These were systematically and thoroughly done and undoubtedly helped to bring the epidemic to an end. Loss of virulence of the strain of bacillus was not responsible for the decline since the cultures isolated from the last autopsy were as virulent as those from the first.

An account is given of the pathological findings in 9 cases of primary pneumonic plague and of some cases of bubonic plague.

A table summarizes observations on the fermentation reactions of 15 local strains including 3 human and 11 rat strains. All fermented glucose, mannite, laevulose and arabinose. None fermented lactose, cane sugar, dulcite, raffinose and glycerine. 11 strains gave acid in maltose; 1 gave a very slight reaction; and 3 failed to ferment this carbohydrate. A good positive reaction in salicine was given by 4 strains; a slight reaction by 6 strains; and no reaction by 5 strains. A good positive reaction in galactose was given by 3 strains; a slight reaction by 6 strains; and 6 failed to ferment galactose. These results are consistent with those of previous workers except that the Californian strains seem to possess little ability to ferment galactose. The fermentation tubes were kept in each case for 7 days.

An infection of the rats at Los Angeles with bacteria of the Salmonella group gave lesions which caused confusion with those of plague. It would be interesting to know whether there was any evidence that such rats were taken from areas where rat virus had been laid down.

A note on the complement-fixation reaction in plague infections indicates the probability that this test has a greater positive than negative value. A simple technique is suggested for the demonstration of agglutinins in immune sera; this consists in growing the plague bacillus in broth containing graduated dilutions (1 in 10 to 1 in 300) of sterile inactivated immune serum. The results are compared with those in a series of tubes which contain corresponding amounts of normal serum; flocculation occurs more quickly and is more marked in the tubes containing the immune serum.

G. F. Petrie.

Doorenbos (W.). Bijdrage tot de kennis van de epidemiologie van de pest in Egypte. [**On the Epidemiology of the Plague in Egypt.**] —*Nederl. Tijdschr. v. Hyg. Microbiol. en Serol.* Leyden. 1926. Vol. 1. No. 4. pp. 278–304. [10 refs.] [Lab., Quarantine Council of Egypt, Port Tewfik.]

The occurrence of epidemics of plague in Egypt depends, as elsewhere, on the contact between man, flea and rat and all those conditions associated with it, as housing, nature of soil, temperature, moisture, species of rats and fleas, etc. In the northern ports plague is most common between May and September, when conditions are most favourable for the development of *Xenopsylla cheopis*.

Between February and June, 1926, the author investigated in Port Said for the Quarantine Council of Egypt the conditions of rats and their fleas, paying special attention to the influence of season on the average number of fleas per rat. More than 3,000 living rats were collected from various parts of Port Said, but in none of them could

plague bacilli be detected. Only in one case of a dead rat were plague bacilli isolated. All the rats collected in the Arabian quarter were of the species *R. norvegicus*. In the European quarter were caught 47 *R. rattus*, all in warehouses; mostly in the Bonded Stores. The author thinks that these were imported by ships.

Amongst the fleas found on these rats two species predominated: *Xenopsylla cheopis* and *Leptopsylla musculi* (*Ctenopsylla musculi*). The investigations show that while the average number of the *X. cheopis* per rat increased gradually from February to June, the number of fleas of the other species decreased continuously.

Although there was apparently an epidemic of plague amongst the rats in March, no cases occurred amongst men, probably because during that month the average number of *X. cheopis* was low and also because the contact between man and *R. norvegicus* is not a close one. The *X. cheopis* is a rather lazy insect and does not jump far, while the *Leptopsylla musculi* is of little importance in the transmission of plague from rat to man, since men are not easily bitten by it.

The author gives also an account of his experiments with d'Hérelle's bacteriophage. This was sufficiently virulent to dissolve in 20–30 hours a 24-hours-old culture of plague bacilli in broth. He used rats of the *norvegicus* species weighing 150–200 grams each.

Eight rats were inoculated with 0·1 cc. of an emulsion of liver from a rat which died of plague. Four of these rats were fed on bread only. They died after 3–4 days and their organs showed typical signs of plague. The other four were fed on bread to which 1 cc. of the bacteriophage F.P. No. 31 was added. One of this group remained alive, three others died after 4–7 days, the organs showing a picture of a less acute character. In one case the culture from organs remained sterile.

In another experiment 0·2 cc. of a freshly prepared bacteriophage (F.P. No. 5) was injected under the skin of four rats and at the same time the animals were inoculated with 0·1 cc. of a culture of plague bacilli in broth. Four others received a dose of 0·01–0·1 cc. of this culture, but no bacteriophage.

The first four remained alive, while the others died after 3–4 days.

H. Lwow.

ALLAN (W.). **Report on Plague in Nigeria for the Year ending 31st December, 1926.**—*Ann. Med. & San. Rep. Nigeria, 1926.* Appendix E. pp. 191–201. With 6 figs. on 3 plates.

This is an ordinary official report illustrated with photographs showing how difficult it is to cope with the spread of plague in crowded areas of houses with thatched roofs and bamboo; and where trading in foodstuffs is carried out in the streets. During 1926, 497 cases were reported with 476 deaths; of the total number 44·5 per cent. were bubonic, 48·7 per cent. septicaemic and 6·8 per cent. pneumonic. Pneumonic cases were most numerous in October. Full details of methods for rat destruction and other sanitary precautions are given; they contain nothing new. 16,303 inoculations against plague were carried out by the Port Health organisation and 15,778 persons were inoculated by other departments.

J. H. Tull Walsh.

GIRARD (G.). Epidémiologie de la peste pulmonaire à Madagascar. Deuxième mémoire. [**Epidemiology of Pulmonary Plague in Madagascar.**]—*Bull. Soc. Path. Exot.* 1927. July 13 & Oct. 12. Vol. 20. Nos. 7 & 8. pp. 632–652; 759–770. With 1 map & 1 chart in text. [26 refs.] [Pasteur Inst., Tananarive.]

From observation and from experiments the author draws the following conclusions :—

1. The pneumococcus retards the evolution of pulmonary plague in man.

2. In animals the association of the pneumococcus with *B. pestis* causes an infection more serious than where these germs are inoculated separately [see this *Bulletin*, Vol. 24, p. 934 (GIRARD)].

J. H. T. W.

LONG (John D.). [Recherches sur les possibilités d'introduction et de propagation de la peste bubonique dans la zone du canal de Panama.] [**Possibility of Introduction of Plague into the Panama Canal Zone.**]—*Boletin de la Oficina sanitaria panamericana.* 1927. Oct. Vol. 6. No. 10. p. 701. [Summarized in *Bull. Office Internat. d' Hyg. Publique.* 1927. Oct. Vol. 19. No. 10. pp. 1496–1499.]

The last case of locally produced plague occurred in the Canal Zone in 1905. Since then a constant war on rats has been made by trapping and poison and by protecting buildings. In the district of Ancon-Balboa a great part of the quays and houses are constructed of cement and wooden buildings are raised. In the district of Christobal-Colon the conditions are much the same and constant inspection is carried out. In the district of Panama 50 to 60 per cent. of the houses are rat-proof. The identification of fleas is carried out and the chief species found is *X. cheopis*. The author thinks that plague can only be introduced by ships stopping at canal ports. Such ships are generally fumigated in United States ports, but ships coming from S. America which have not been periodically fumigated must be considered as asylums for infected rats. Finally, as regards wild rodents possibly susceptible to plague the author records two wood rats: *Sigmodon hispidus chiriquensis* and *Proechimys semispinosus panamensis*; but no experiments have yet been made, nor are their fleas known.

J. H. T. W.

FORSTER (W. H. C.). **Predicting Epidemics of Plague in the Punjab.** —*Public Health Rep.* 1927. Oct. 14. Vol. 42. No. 41. pp. 2502–2508.

" 1. The seasonal curve of plague mortality in the Punjab for the period 1901–1924 shows a progressive and uninterrupted high monthly increase from August to the following April.

" 2. The number of fleas per rat shows, according to the data on hand, a similar curve.

" 3. The mortality from plague, other than pneumonic [which plays no important part in the Punjab], being the expression of the number of infected fleas which have bitten human beings, it is logical to assume that the reproduction of fleas has an important influence upon the seasonal mortality curve.

"4. As a corollary to (3), a check in the cycle of reproduction of fleas should be reflected in a corresponding decrease in the seasonal mortality curve.

"5. Humidity being a factor of vital importance in the cycle of flea reproduction, it is reasonable to assume that, in the arid plains of the Punjab, that cycle is affected by the rains.

"6. Analysis of statistical data for 26 years shows that a drop in the seasonal curve for December indicates no epidemic the following spring.

"7. . . . A decline in the fall-winter part of the curve, whatever it may be in the other months, is not necessarily an indication that there will be no epidemic the following spring."

J. H. T. W.

PAISLEY (J. C.). **The Diagnosis of Rat Plague. An Analysis of Two Hundred Recent Post-Mortems.**—*West African Med. Jl.* Lagos. 1927. Oct. Vol. 1. No. 2. pp. 35–36.

The post-mortems were carried out from November 16th, 1926 to January 22nd, 1927, and from February 11th, 1927 to July 30th, 1927. During the first period the epizootic was at its height, while the second corresponds to a time of sporadic cases only. Subcutaneous congestion is common and may be detected before the skin is incised, the thorax and legs especially having a pink appearance. Congestion of the smaller vessels of the thorax and cervical regions has been found to be almost diagnostic. Subcutaneous haemorrhages are not common and not confined to plague rats. A primary bubo when present is the most characteristic sign of plague; they may be multiple and were found in the groin, axilla, cervical and other regions. In the first series 47 rats had no buboes and in the second series 10 had no buboes. The liver does not give information of much value, nor does the spleen show any characteristic change. The intestine in certain plague rats showed extensive haemorrhages and the small intestine was full of altered blood—20 rats in series I and 17 in series II. Pleural effusion is a fairly constant sign.

J. H. T. W.

CARMAN (J. A.). **The Treatment of Bubonic Plague with Iodine, Camphor and Thymol.**—*Kenya & East African Med. Jl.* 1927. Oct. Vol. 4. No. 7. pp. 196–200. With 2 charts.

The author refers to the need for some drug that will exert a specific lethal action on *B. pestis*. Neosalvarsan, novarsenobillon and Bayer 205 have been tried, but none of these has proved to have a definitely specific action on the disease. Dr. Carman's treatment is based on the observations of MALLANAH [*v.* this *Bulletin*, Vol. 16, p. 430]. The treatment was commenced, during an epidemic in Nairobi, in December, 1926. All patients were given a purgative and an injection as soon after admission as possible. The injection into the bubo contained: tinct. iodi mitis m. 15, camphor and thymol āā gr. 7½ in 2·0 cc. distilled water. If the temperature did not drop by next day another injection of half the dose was given; otherwise a full dose was given on alternate days until recovery was assured. Two cases are described in detail with temperature charts. The following statistics are given: Whereas of 64 cases treated in this epidemic 33 died, the number of deaths in the 27 treated by iodine, etc., was 9.

J. H. T. W.

Pal (R. D.). **The Serum Treatment of Plague.**—*Indian Med. Gaz.* 1927. Oct. Vol. 62. No. 10. pp. 569–570.

After reviewing various drugs that have been, or are at present, used for the treatment of plague the author states that the only treatment that has had any consistent success in his hands has been with anti-plague serum (obtained from the Pasteur Institute, Paris, or the Indo-French Drug Co., Bombay). The author has been using the serum for the last three years with most encouraging results. 40 to 60 cc. have been given intravenously morning and evening till the temperature drops to normal. It is waste of time to give the serum subcutaneously. Most of the failures of serum treatment are due to the small dosage employed and the fear of anaphylaxis which scares many a medical man from giving it intravenously. Should anaphylaxis appear adrenalin is used to combat it. The author also recommends small doses of morphia to check restlessness and to encourage sleep; and the following stimulant mixture:—

Ammon, carb.	gr. v.
Digifortis	m. x.
Aqua chloroform	ad oz. i.

which may be given every 4 hours.

J. H. T. W.

Roques (P.). Notes au sujet de la sérothérapie préventive de la peste pulmonaire. (Observations faites au camp d'isolement de Mahazoarivo, Tananarive, du 1er janvier au 25 mai 1927). [**Serum Prophylaxis for Pneumonic Plague.**]—*Bull. Soc. Path. Exot.* 1927. July 13. Vol. 20. No. 7. pp. 579–583. [Municipal Bureau of Hyg., Tananarive.]

The cases treated were mainly plague "contacts" isolated in a special camp. For those exposed to contact with bubonic plague, one subcutaneous injection of 20 cc. of anti-plague serum seemed to confer immunity. In the cases of "contacts" with septicaemic plague an intravenous injection of 100 cc. of serum conferred a similar immunity. With those exposed to possible infection from pneumonic plague an intravenous injection of 100 cc., given on the first day of isolation reduced the mortality by nearly 50 per cent.; but this method can only be used when the contacts are isolated and under observation. The doses noted are for adults; for children they are reduced according to age. This serum preventive treatment should be undertaken as early as possible in "contacts" or suspected "contacts."

J. H. T. W.

Caius (J. F.), Kamat (S. A.) & Naidu (B. P. B.). **The Bactericidal Action of Some Organic Compounds of Mercury on** *Bacillus pestis.*—*Indian Jl. Med. Res.* 1927. Oct. Vol. 15. No. 2. pp. 327–333. [2 refs.] [Haffkine Inst., Parel, Bombay.]

Two groups of organic compounds were used, derived from mercuration of (1) phenol, (2) the dye stuffs trypan blue, trypan red and acid fuchsin. The bactericidal action of these derivatives was tested by the inhibitory method, which showed that they were much more

active than the phenol or dye stuff from which they had been prepared. Their activity was very uniformly proportional to the amount of mercury present and not to any extent altered by modifications in chemical constitution.

W. F. Harvey.

Naidu (B. P. B.) & Shamsher Jang. **Production of Alkalinity by *B. pestis* in Broth and the Effect of this Alkalinity on the Toxicity and Potency of the Prophylactic.**—*Indian Jl. Med. Res.* 1927. Oct. Vol. 15. No. 2. pp. 335–341. With 1 chart in text. [6 refs.] [Haffkine Inst., Parel, Bombay.]

The growth of plague bacilli in broth results in production of alkali and cessation of growth. This cessation of growth is not due to exhaustion of nutrient elements, but is simply the effect of alkalinity, as can be shown by neutralization experiments. The alkalinity attains its maximum between the fifth and eleventh weeks and undergoes slight rise and fall thereafter up to the end of the incubation period, extending to 176 days. At the end of this time the organism is still viable. The amount of alkali present in the broth vaccine does not affect either its toxicity or its potency.

W. F. Harvey.

Semikoz (T.). **The Apparatus for the Infection per inhalationem of Little Animals with Highly Pathogenic Microbes** (*B. pestis*).—*Rev. Microbiol. et Epidémiol.* 1927. Vol. 6. No. 3. English summary p. 382. [In Russian pp. 345–348. With 3 text figs. 2 refs.]

Three figures in the Russian text (p. 347) make clear the construction of the apparatus. The advantage of the proposed apparatus is that the animals having been subjected to the inhalation can be removed into the clean division when required. This can be accomplished without any risk to the experimenter with the aid of two rods : One opening and closing the doors between the divisions, the second removing the cage from the division, where the emulsion of *B. pestis* has been sprinkled, into the clean one where the animals are kept for a definite time.

J. H. T. W.

v. Jettmar (H. M.). Beiträge zum Studium der Pest unter den Insekten. II. Mitteilung. [**Plague among Insects.**]—*Ztschr. f. Hyg. u. Infektionskr.* 1927. July 25. Vol. 107. No. 3-4. pp. 498–509. [17 refs.] [North Manchurian Plague Prevent. Service, Harbin.]

The author reviews the work of other investigators and gives results of his own experiments :—Cockroaches (*Blatta orientalis*) can live after feeding for more than a month on material containing *B. pestis* and their eggs produce healthy young. He was never able to infect guineapigs with fresh excrement from cockroaches fed on plague material. Inoculation of *B. pestis* into the coxa stump of an amputated leg did not produce any fatal signs of plague in cockroaches or in locusts ; nor could locusts by infected by feeding.

J. H. T. W.

DE SMIDT (F.). **The Problem of Plague and Protective Vaccines: a Semi-Technical Commentary.**—*Kenya & East African Med. Jl.* 1927. Oct. Vol. 4. No. 7. pp. 210–223. [9 refs.]

Most of this commentary is controversial and deals with the merits and demerits of an agar plague vaccine and the bouillon vaccine associated with the name of Haffkine. The Nairobi prophylactic vaccine is of a slightly modified Haffkine type.

W. F. Harvey.

ABBATUCCI. La peste. Sa symptomatologie. Sa prophylaxie. Son traitement. —*Bruxelles-Méd.* 1927. Nov. 27. Vol. 8. No. 4. pp. 102–104. [2 refs.]

CHOKSY (N. H.). A Post-Graduate Lecture on the Pathology of Plague.—*Indian Med. Gaz.* 1927. Sept. Vol. 62. No. 9. pp. 510–514. With 5 charts in text.

GRUBBS (S. B.). Bubonic Plague and Maritime Quarantine. A Suggested System of Plague Control, assuming that there is Infectible and Non-infectible Territory, discussing the Cheopis Index as a Measure of Infectibility, and advocating the Rat-Proofing of Ships to prevent the Spread of Plague by Sea.—*Public Health Rep.* 1927. Aug. 12. Vol. 42. No. 32. pp. 2045–2056. [26 refs.]

HIRST (L. Fabian). Rat-Flea Surveys and their Use as a Guide to Plague Preventive Measures.—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1927. Aug. 31. Vol. 21. No. 2. pp. 87–104. With 4 figs. (1 map). [10 refs.] [City Microb. Lab., Colombo, Ceylon.]

MATTOS (Emygdio). Peste.—*Archivos de Hyg.* Rio de Janeiro. 1927. May. Vol. 1. No. 1. pp. 125–143.

HEAT STROKE.

Wakefield (E. G.) & Hall (W. W.). **Heat Injuries. A Preparatory Study for Experimental Heat-Stroke.**—*Jl. Amer. Med. Assoc.* 1927. July 9. Vol. 89. No. 2. pp. 92–95. With 1 text fig. [32 refs.]

The authors give a short history of heat stroke and certain tables from which they compile the following summary :—

" A study of the heat injuries as they have occurred in the United States Navy since 1861 shows that there have been thirty-eight deaths and forty-three invalided from the service.

" This study appears to indicate that the incidence of heat injuries is greater in those born and reared in the northern section of the country than it is in those from the South."

[*v.* this *Bulletin*, Vol. 23, p. 457 (*U.S. Nav. Med. Bull.*).]

J. H. Tull Walsh.

Hall (W. W.) & Wakefield (E. G.). **A Study of Experimental Heat-Stroke.**—*Jl. Amer. Med. Assoc.* 1927. July 16. Vol. 89. No. 3. pp. 177–182. With 2 charts in text. [39 refs.] [U.S. Naval Med. School, Washington, D.C.]

The experimental dogs reacted with the clinical syndrome of heat exhaustion as well as that of thermic fever. The chemical observations of the blood and the pathological changes in tissue showed that there was great renal injury, evidenced by progressively increasing azotaemia. This nitrogen retention is obviously not a portion of the essential changes of the early, acute condition. Blood sugar increased in some cases, decreased in two cases and remained relatively constant in others. In most instances blood chlorides increased ; the average showed increase of 26 mgm. per 100 cc. Alkali reserve, as recorded by plasma carbon dioxide, decreased markedly, going as low as 10·7 per cent. by volume in one case. Lactic acid content of the blood showed an average increase of 96·2 mgm. per 100 cc. The important acute pathologic change in major heatstroke is a massive increase in lactic acid with resulting acidosis. Serum pH decreased in seven cases observed. Total nitrogen and total solids did not demonstrate any significant change in blood concentration. Inorganic phosphorus of the serum was slightly increased and serum calcium showed increase. The pathologic changes were : rigid contraction of the left heart, venous congestion, contraction of the intestines and urinary bladder, dilatation of the stomach, and cloudy swelling and degeneration of the parenchymatous elements, particularly those of the glandular and nervous character. There was no reaction in the connective tissue except in the lungs in which interstitial oedema was present.

J. H. T. W.

Dodd (Katharine) & Wilkinson (Scott J.). **External Heat a Cause of Fever in Children.**—*Jl. Amer. Med. Assoc.* 1927. Mar. 12. Vol. 88. No. 11. pp. 787–788. With 1 chart in text. [6 refs.]

The authors point out that external heat is not usually mentioned as a cause of obscure fever in children. Five infants whose fever was

definitely caused by external heat not only had fever but were restless and irritable. As soon as they were placed in a comparatively cool room with moving air, their temperatures became practically normal and they were quiet and contented. Coloured children were not similarly affected by the heat. An artificially cooled room, with good circulation of air should, if possible, be provided in Southern hospitals that care for sick infants.

J. H. T. W.

Allen (H.). **Heat-Stroke, and Heat-Syncope.**— *Vet. Jl.* 1927. Mar. Vol. 83. No. 3. pp. 120–122.

The cases referred to are those of heat-syncope occurring in horses at the Remount Depot at Mona in the Punjab. Pathological effects of high temperature are only evident when there is a marked amount of atmospheric humidity. In heat-stroke there is extremely high fever, and in heat-syncope symptoms of collapse and low bodily temperature are evident. The general symptoms in horses are loss of appetite for the first two days, progressive dullness and marked depression, drooping head, fixed eyes and dilated pupils, uncertain gait, respiration laboured and accelerated, nostrils dilated and in some cases epistaxis from one or both nostrils. The mortality is not stated. Over 40 blood smears were examined with negative results. All cases were placed in loose boxes with plenty of drinking water and liberal supply of green forage and bran. Enemata of cold water and cold applications to the cranial region were used. If high temperature (106–108°)* persisted for three days intravenous injections of hydrobromate of quinine (30 grains) were given. Some cases showed alarming symptoms of over stimulation and collapse after the injections, but resumed the normal in about half an hour. Hypodermic injections of camphorated oil were administered when cardiac stimulation was needed.

J. H. T. W.

* The average rectal temperature of the horse is 100·4°. (Veterinary Posology: Banham & Young).

REVIEWS AND NOTICES.

KNOWLES (Robert). [B.A. (Cantab.), M.R.C.S., L.R.C.P., Lt.-Col., Indian Medical Service, Fellow of the Asiatic Society of Bengal, Professor of Protozoology, Calcutta School of Tropical Medicine.] **An Introduction to Medical Protozoology with Chapters on the Spirochaetes and on Laboratory Methods.**—pp. xii+887. With 174 text figs. & 15 coloured plates. 1928. Calcutta: Thacker, Spink & Co. [£2. 1. 8 or Rs. 25.]

In his Preface the author of this work says that when he "first commenced to teach medical protozoology to post-graduate students at the Calcutta School of Tropical Medicine in 1921, one of his chief difficulties was the want of any suitable text-book in English on the subject. The information required was scattered throughout the chief medical [and he might have added zoological] research journals of the past twenty [he might well have said fifty] years, but it was nowhere collated into a good text-book in English, whilst the sections on protozoology in the text-books of tropical medicine of that date were scanty, sketchy, and for the most part inaccurate." [This is so true, and so feelingly expresses universal experience, that it inspires one with confidence to read on. The man who has felt this has our instant sympathy.] . . . "The writer therefore decided on the compilation of the present volume—intended primarily as a text-book for the students of the Calcutta School of Tropical Medicine, but also, he hopes, as a useful laboratory text-book for laboratory workers in India and elsewhere."

The resultant book's 887 pages are apportioned thus: Part I, "Lectures in Medical Protozoology," pp. 1–625 (19 lectures); Part II, "Laboratory Methods," pp. 627–769 (7 chapters); Part III, "References to Literature" [Why not "References" simply? Are not all references "to literature"?], pp. 771–862 (about 2,000 entries). There is a good index, also, of some 25 pages, and the text is illustrated by numerous Plates (mostly in colours) and an abundance of text-figures—many of which occupy a full page. All the Protozoa of medical interest are dealt with in detail, in systematic order, in Lectures I–XVI. Lectures XVII and XVIII are devoted to the Spirochaetes [now, unfortunately, tied by tradition to the Protozoa, though no competent worker any longer assigns them even to the Animal Kingdom]; while the final Lecture discusses "Diseases due to Rickettsia bodies" and "The Chlamydozoa as cell-inclusions," and ends with "Some notes on Rabies." Short sections on technical details (in Part II) have been contributed by R. SENIOR-WHITE and R. O. A. SMITH.

"The writer regrets that so little of this volume is original, and so much of it 'loot.' In the interests of his students he has unblushingly borrowed, stolen, and appropriated wholesale." The major part of this "looting" has been, avowedly, from WENYON's *Protozoology* (1926), though the reviewer's works—especially those on intestinal protozoa—and PATTON and CRAGG's *Medical Entomology* have also been freely drawn upon. Every accessible stream of information (including some which were probably inaccessible at their source) appears, indeed, to have been diverted to the author's purpose, and the confluent then filtered and bottled and neatly labelled for consumption by the student.

As it is obviously impossible, in the space available, to summarize a detailed and fully documented work of this magnitude, the reviewer will attempt to do no more than record his own general impressions and opinions.

Perhaps the strongest impression received, after perusal of the whole work, is a personal impression of the author—who strikes the keynote of his book in dedicating it not to some celebrated protozoological pundit, but to his tried and trusted Indian junior. He is so obviously sincere

and workmanlike, so eager to learn and to confess his sins, that it is difficult —if not impossible—to criticize him : and he is so modest and unassuming withal, that an ignorant or unwary reader might easily infer, from his words, that his personal contributions to this work have been but small. Yet this is by no means true. It required a good deal of originality and courage—not to mention knowledge and industry—to compile such a book in such a fashion ; and when it is remembered that the whole work was written in nine months—as the author himself tells us—and has been entirely made and printed in India, one can only marvel at the result. Few men now living could have made as good a job of it, and probably none could have done it better. In the opinion of the reviewer this is, indeed, the best book, taking it all round, that has yet been published on medical protozoology—in any language or in any land.

This is not to say that it is free from faults, for no book which attempts to survey so vast and varied a field ever could be. But the faults appear trivial in comparison with the merits. The author writes fluently and often colloquially—as befits the lecture-form in which his information is imparted—so that he is easy to read and understand. But he sometimes, in consequence, writes loosely (as, for example, when he say on p. 536 that " one spirochaete at least—*Spirillum minus*, the parasite of rat-bite fever—has a rigid structure and pre-formed coils " [distinctive characters of *Spirillum* as opposed to *Spirochaeta*]) ; and he frequently splits his infinitives. As the bulk of his writing is so clear and easily assimilable, however, it is unfair to emphasize minor blemishes. Moreover, many of his mistakes are not his own, but are copied from " authorities " in whom he put his trust. The reviewer, being one of these, can say this without prejudice. [He confesses, indeed, to feelings of considerable embarrassment on finding some of his own imperfect efforts referred to as " splendid "—and even " classical " : for he is well aware that such exuberant epithets are properly applicable to very few publications in medical protozoology.] As might be expected, the author is most interesting and instructive when he speaks about things of which he has himself a good working knowledge, and about protozoa which have been objects of his own researches. Particular attention may be directed to the sections dealing with kala azar and rabies, which are both " original," and not mere compilations. His descriptions and figures are usually graphic and adequate, and his lapses—on the whole—infrequent. Occasionally, however, his words are too graphic : for example, when he speaks of *Arcella* as " bean-shaped " (p. 28). [It took the reviewer some seconds to realize that this entire misdescription is derived from pictures of this rhizopod in books, which often show it thus in optical section.] Almost invariably the author is least accurate when he wanders into non-medical protozoology ; and here, occasionally, he becomes positively inaccurate. For instance, he says (p. 6) that " the Protozoa . . . leave no fossil remains ": from which one can only conclude that he has never dug into the immense literature on fossil Foraminifera and Radiolaria [which date back to Precambrian times] or ever made a microscopic examination of the chalk with which he daily draws upon his blackboard.

On most subjects the author is well informed and up-to-date, and his judgement regarding recent matters still *sub judice* usually appears to be sound. This applies both to the " Lectures " and to the " Chapters " in the practical part. In the technical sections, however, the reviewer—from his own experience—frequently finds himself at variance with the author on points of detail. He is ready to prove, for instance, that " Schaudinn's Fixative " (p. 680)—called " the premier fixative for all film work " and " *the* fixative "—is not that of SCHAUDINN himself : that DOBELL has never employed an " alcoholic haematin stain " (p. 695)—being well aware that haematin is not an oxydation-product of haematoxylin, but a blood-pigment : and that the methods advocated for staining spirochaetes in bulk with silver (p. 702), and for imbedding insects or other chitinous objects (p. 737), are among the worst possible—since they

contravene fundamental principles in both processes. Misprints, also, are not infrequent; but for this the author may not be wholly to blame. Fig. 7 (p. 12) is printed upside-down; while *Paramecium* is invariably miscalled "*Paramœcium*," and several proper names—such as "Butschli" (for BÜTSCHLI) and "Bœck" (for BOECK)—are misspelled throughout. It is annoying to see the name of one of the greatest of protozoologists repeatedly misprinted: but it is also against the Rules of Nomenclature to print the specific name of the *Iodamoeba* of man without its proper diacritic marks. Possibly these are somewhat pedantic criticisms, yet they involve questions of principle which are not negligible in a book of this character.

In judging such a book, one has to consider (1) whether its statements, in the main, are true rather than false; (2) whether its information is helpful or unhelpful; and (3) whether it is readable or unreadable. The reviewer has found the present work true, in the main (as far as his own limited knowledge enables him to judge), helpful, and readable; and he therefore commends it to all serious students of medical protozoology. It appears to him to be an honest and successful and consequently a praiseworthy attempt to advance the subject with which it deals; and as a fellow student—albeit with different aims and different interests—he therefore welcomes the book as a real addition to the literature. When he recalls the difficulties under which he himself laboured, when a very beginner, through lack of such a work, he envies the present-day student. Though so much less was known twenty-five years ago, it was then much harder to acquire the rudiments of medical protozoology than it is to-day.

The appearance of this book is, without doubt, an event of more than local interest. It marks a definite step in the advancement of its subject—not only from the purely scientific and medical, but also from the educational standpoint. It may—and the reviewer thinks and hopes that it will—even mark a turning-point in the teaching of medical protozoology everywhere, and the beginning of a new period of progress in the science itself. At all events, with this work at his disposal no student (or teacher) has any longer a good excuse for ignorance; and if further advances do not follow, it will not be Col. Knowles's fault. The Calcutta School is fortunate in possessing such a Professor of Protozoology, whose words deserve an audience much wider than the immediate circle of his Indian pupils. It is no exaggeration to say that if there were, among zoologists and medical men, a few more pupil-teachers of his stamp, the future of medical protozoology would already be assured.

Everyone interested in the Protozoa should buy or borrow this book—and read it. He will probably find at least one mis-statement on every page; but present-day protozoological science is full of mistakes, so that the work is not to be condemned for this reason. Rather is it to be praised for its general truth, and for setting errors in bold relief. Anyway, the reviewer can say with some confidence that, to his knowledge, no better introduction to medical protozoology has yet appeared in print.

Clifford Dobell.

SCHUBERG (A.). Das gegenwärtige und frühere Vorkommen der Malaria und die Verbreitung der Anophelesmücken im Gebiete des Deutschen Reiches. [**The Occurrence of Malaria in Germany Now and in the Past and the Distribution of Anopheles.**]—*Arb. a. d. Reichgsndhtsamt.* 1927. Nov. Vol. 59. No. 1-2. pp. 1–427. With 1 folding map & 3 figs.

During the course of the war of 1914–18, and for some time after it had come to an end, much anxiety was felt in Germany, as in other countries of Europe, lest the unusual conditions should lead to an outbreak among

the civil population of certain diseases which have always been associated with military operations. Former wars have often been responsible for epidemics of enteric, typhus, cholera, smallpox and other diseases, and it was reasonable to fear that the late war might be followed by similar results. No war had ever been waged on such a large scale and over such an extensive area; in Germany alone, over thirteen millions of men had been mobilized for military purposes, and land campaigns were conducted in many parts of three of the continents. There were many novel conditions, too, which made this war very different from all preceding ones. Hitherto the danger of wide-spread outbreak of malaria had scarcely occurred, and the remarkable and rapid decline in the prevalence of this disease in all the countries of North Western Europe would have allayed all anxiety on this score in normal circumstances. But the circumstances were not normal: on the enemy side, large numbers of white and coloured troops hastened to the European seat of war from many parts of the Tropics and sub-tropics, and it was certain that a considerable proportion of the men would come already infected with malaria. Many of them were living closely herded together in the inevitably insanitary conditions of active warfare; their powers of resistance to infection were lowered by the hardships to which they were exposed; the war was carried on in numerous swampy and inundated districts (Russian Poland, the Balkans, Asiatic Turkey, Flanders) where there was no lack of suitable mosquito carriers; and supervision was bound to be inadequate at a time when so many more urgent matters claimed the immediate attention of medical officers in the field, and of Public Health officials in Germany itself. It was well known that, even up to fifty years ago, malaria had been common in most of the areas concerned, and the fact that it had become practically extinct in many of them was to be attributed almost entirely to the greatly improved standards of personal hygiene and general sanitation; now, as the result of the conditions of warfare, these had reverted to a considerable extent to those of malarious times. It seemed natural, therefore, to fear that this disease, which had become almost unknown in the favourable conditions of peace, would now revive in the unfavourable conditions of war. The large numbers of prisoners of war in the camps scattered over Germany, and the certain presence among them of many malaria cases seemed to be an additional menace to the public health. Moreover, it was likely that the advent of peace, with the return to Germany from abroad of many interned German citizens and prisoners, and the demobilization of large numbers of men from the various theatres of war would only bring new dangers with it. As regards the army, the fear of a considerable increase of malaria was well founded; after venereal diseases, malaria was indeed the greatest scourge among the armies in the field; but, although the number of indigenous cases of malaria among the civil population was certainly larger than it had been before the war, the anticipation of an outbreak on a large scale has not been realized.

The consideration of these facts led Dr. A. Schuberg to undertake the task of comparing the present prevalence of malaria in Germany with that of former times. In this book he quotes many old records from all the provinces of Germany, and he has made a very thorough study of the literature of the subject. Naturally, in the days before the discovery of the malarial parasites and of the mode of transmission of the disease, there are many cases in old reports of which the diagnosis must remain uncertain; but, although absolute proof is lacking, the diagnosis of careful clinicians cannot be set aside lightly. As in England and France, so too in Germany, there is no doubt whatever that ague was formerly extremely prevalent in many places whence it has now entirely disappeared. For actual figures of the years before LAVERAN'S discovery, the author has had to depend upon admittedly imperfect records, but the statistics for the army and other tables that he gives show very clearly indeed that malaria, which was very common in certain Army Corps and among the civil population of some districts, is not met with now. Even the statistics of the present

day can only give an approximation to the truth, since malaria is compulsorily notifiable in only a few districts, and many mild clinical cases are undoubtedly not reported at all.

The factors concerned in the disappearance of malaria are discussed under the following heads: (1) Drainage of the Soil; (2) Domestic Hygiene; (3) The Use of Quinine; (4) Improved Housing of Cattle; (5) Destruction of Mosquitoes. Dr. Schuberg appears to attach much importance to the use of quinine, and quotes R. KOCH (1900) and PFEIFFER (1901), who considered that the great decline of malaria in Germany was chiefly due to the cheapness and general use of this drug; almost the same opinion was held by MUHLENS (1911) and LAUTERBORN (1917). No doubt in many places the habitual use of quinine has been a contributory factor in the great decline of malaria, but the same decline has been just as marked where quinine has played no part, or, at most, a very subordinate one. Romney Marsh, in England, is a case in point. Here ague was formerly very common indeed; nowadays, although *Anopheles maculipennis* is found in this district in very large numbers, and there must be plenty of individuals among the soldiers at Hythe, Lydd, Shorncliffe and elsewhere, who have acquired malaria abroad, and who still harbour the parasites in their blood, there is no malaria. The author himself quotes KROLL (1908) and MARTINI (1920), who give instances of the extinction of malaria in Germany without the use of quinine.

So much has been written of late years about the causes of the practical disappearance of malaria in North Western Europe that it is unnecessary to go further into the matter now.

During the four years of the war, Dr. Schuberg estimates that considerably more than a quarter of a million cases of malaria, acquired abroad, returned to Germany; and he considers it a reasonable assumption that at the end of the war, among every thousand of the total population, there were from one to four malaria carriers. Nowhere was there any increase of malaria of importance, nor were any new centres of infection established in Germany after the war.

The only district in which there was a definite increase of malaria is Aurich, in the province of Hanover; but, even here, the increase is probably only an apparent one, as the statistics of former years were almost certainly underestimates of the real prevalence of the disease. It is very likely, too, that the interruption of preventive measures, owing to war conditions, was a contributory cause of the increase, if such actually occurred. At any rate, there is no direct evidence that the increase of malaria in this district was due to the introduction of infected cases from without; Malaria has always been endemic in Aurich, especially in the country round Wilhelmshaven and Emden. The records of malaria here go back for at least a hundred years. Thus, in 1826 there were "several thousands suffering from malaria." As elsewhere, the amount of malaria fluctuated from year to year, though, on the whole, there has been a considerable decline. Moderately severe epidemics occurred in 1906 and 1907; in 1913, 113 cases were notified, and in 1914, from the 15th March to the 31st August, there were 90 new cases. During the years of the war the numbers increased to 252 in six months of 1915, 434 in eight months of 1916, and 953 in seven months of 1917. There is some confusion about the figures for 1918, but at least 4,760 cases of malaria occurred of which only 182 were soldiers and 84 prisoners of war, the great bulk of the cases being among civilians; in 1919 there were about 4,000 cases. After this year there has been a rapid decline, with, however, the usual fluctuations. In 1920 only 126 cases are recorded, but there was an increase up to 655 cases in 1926.

The distribution of the species of Anopheles in Germany, as far as it is known for certain, is given by Dr. Schuberg; it includes practically the whole of Germany, though, of course, the prevalence varies in different parts of the country.

The author must be congratulated on this useful book, the writing of which must have been a very laborious task ; he has replaced by definite facts what were formerly, in many cases, merely general impressions or vague surmises.

There is a very complete bibliography, which naturally, owing to the subject, is almost confined to German publications.

H. J. Walton.

Rogers (Leonard). [C.I.E., M.D., B.S. (Lond.), F.R.C.P., F.R.C.S., F.R.S., I.M.S. Ret., Physician & Lecturer, London School of Tropical Medicine, etc.] **Recent Advances in Tropical Medicine.**—pp. viii + 398. With 12 illustrations. 1928. London : J. & A. Churchill, 40 Gloucester Place, Portman Square, W. 1. [12s. 6d.]

There will be universal agreement that Tropical Medicine is not now making such strides as it did two or three decades ago ; yet much detailed work is reported yearly from widely scattered parts of the world. Apposite critical abstracts of these reports appear in the *Tropical Diseases Bulletin*. The author acknowledges this boon to the vast majority of practitioners in the tropics situated far from libraries ; and his own indebtedness to that *Bulletin* for much of the information in the present work. His historical paragraphs are interesting and evidently prepared with care, and he has summarized in very readable manner his selection of what he has judged to be the more important of recent work on leishmaniasis, malaria, trypanosomiasis, relapsing fever, yellow fever, dengue and phlebotomus fever, tick fever, undulant fever, plague, cholera, dysentery, amoebiasis, sprue, ankylostomiasis, schistomiasis, filariasis, leprosy, yaws, beriberi and pellagra. Special attention has been given to treatment, and there are twelve excellent illustrations. In some of these diseases the author has laid us all under real obligation for more accurate understanding of their nature and process and more effective remedy of their ills. It is not to be expected, however, that there will be universal agreement that all of his selections from recent work constitute advance in our knowledge, nor that all of his omissions are not advances.

H. M. Hanschell.

Seventh Congress of the Far Eastern Association of Tropical Medicine. **Souvenir. The Indian Empire. Being a Brief Description of the Chief Features of India and its Medical and Sanitary Problems.**—pp. vii + 346. With 20 plates & 4 maps (1 folding in pocket). 1927. Printed by Thacker's Directories Ltd., 6, Mango Lane, Calcutta, and published by the Executive Committee of the Congress.

This book will serve not only as a souvenir for those who attended the Congress but, also, as a guide book and work of reference for residents in, and visitors to, the Indian Empire. It certainly adds one more to the list of useful books on India mentioned in the Appendix. The information is necessarily condensed and cannot be reviewed at length ; but the reader will find chapters on the physical features, population, scenery and places of special historical or archæological interest, agriculture and the history of India from ancient times. Medical, sanitary and veterinary research are dealt with and the book contains short sections recording the site and work of the numerous hospitals and research institutes in the Empire. The weather receives attention and there are special articles on racial ethnology, zoology, botany and geology. The photographic illustrations are very good and there is an excellent map in the pocket of the book. The editor and his colleagues can be congratulated on the amount of information they have packed into 346 pages.

J. H. Tull Walsh.

NATIONAL MEDICAL ASSOCIATION OF CHINA. **Medical Guide. Issued on the Occasion of the Seventh Biennial Conference Jan. 27th to Feb. 2nd, 1928, Peking.**—118 pp. With 1 map & 10 plates. 1928. Peking: Printed by the Commercial Press, Ltd.

The Publication Committee of this brochure, published in Chinese and English with many illustrations, write that with the development and progress of modern medicine in China there is need for a directory of medical institutions and practitioners; they have therefore collected the available data and have added a list of supplies of medical apparatus, so that we have a medical directory and buyer's guide in one volume. Several pages are occupied by an account of the medical institutions in Peking, which appears to contain no less than 16 hospitals and dispensaries. There are descriptions of the National Epidemic Prevention Bureau and the Peking Union Medical College, reorganized some years ago by the China Medical Board of the Rockefeller Foundation. The account of the other medical institutions in China is less detailed.

A. G. B.